

ROTUNDA

the magazine of the Royal Ontario Museum

**A MUMMY
REVEALED**

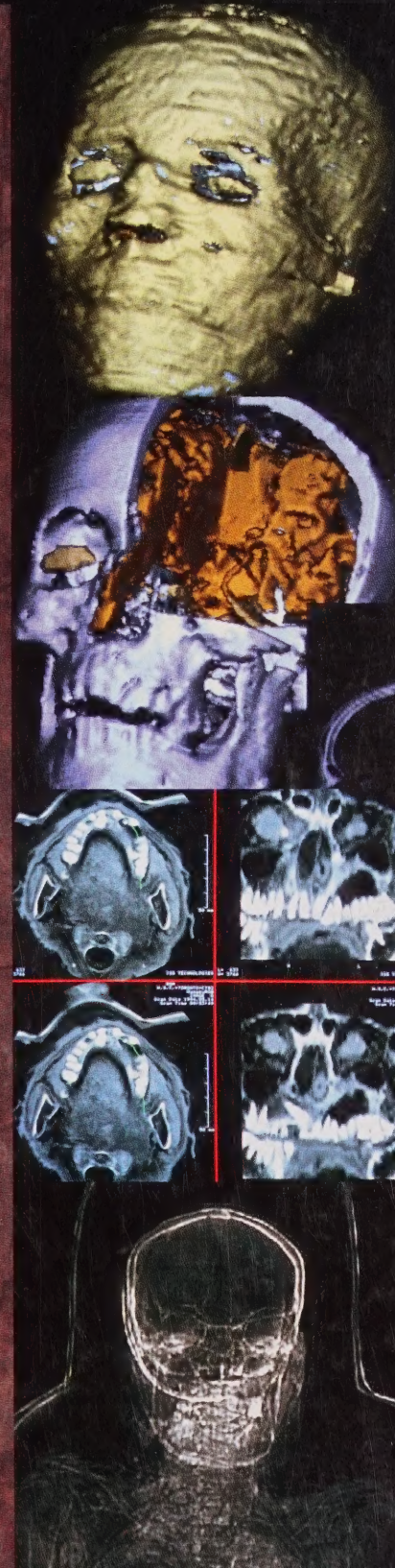
**IMAGES OF
IMPERIALISM**

**MARRIAGE IN
BYZANTIUM**

**FEEDING ON
FOIE GRAS**

**A SHORT-CUT
FOR CLEANING
SILVER?**

VOL. 28/NO. 3
DISTRIBUTED BY CMPA
\$4.25



Masters Gallery Ltd.



Florence Carlyle, A.R.C.A.

"Young Woman Before the Hearth" 1902 40" x 30" O/C

**CARR • GROUP OF SEVEN • MILNE
KRIEGHOFF • 19TH CENTURY • MORRICE**

815 C - 17th Avenue S.W., Calgary, Alberta T2T 0A1 • (403) 245-2064 • Tues. - Sat. 10:00 - 5:30

MEMBER PROFESSIONAL ART DEALERS ASSOCIATION OF CANADA INC.

ROTUNDA

the magazine of the Royal Ontario Museum

Volume 28, Number 3, Winter 1995/96
Date of Issue: November 1995



4

GROWING COLLECTIONS

"Sea Scorpions" and Sea Scorpions

5

FOOD AND CULTURE

Foie Gras, the Cocaine of Cuisine

38

CONSERVATION NOTES

Is There a Short-Cut for Cleaning Silver?

41

ARCHITECTURAL NOTES

St. Mary Magdalene and the ROM

43

ROM ANSWERS

45

BOOK REVIEWS

Vegetarianism, the Leakey Family, Guides to Birds and Fishes, Folk Art, and more...

48

LOOK AGAIN

A Lone Vegetarian

Cover

The mummy of Djedmaatesankh stands in the Ancient Egypt Gallery of the ROM. Medical technology electronically removed the cartonnage and bandages to reveal the body within, enabling researchers and artists to illuminate the life of an ancient Egyptian.

For the story on Djed turn to page 30.

PHOTOGRAPH BY
BRIAN BOYLE

SCANS COURTESY
HOSPITAL FOR SICK
CHILDREN, TORONTO

8

515 MILLION YEARS OF ARACHNOHISTORY

Janet Waddington

Spiders not only have a long history, they are part of a family tree with an astonishing number of branches

18

SCENES OF MARRIAGE IN BYZANTIUM

Paul Denis

Decorations on Byzantine wedding rings are a window to society and marriage more than 1000 years ago

24

IMAGES OF IMPERIALISM

Hugh Wylie

Woodblock prints of the 1894-95 Sino-Japanese War are a vivid reminder of a critical chapter in Japanese history

30

THE FACES OF DJED

Lee-Anne Jack

A CT-scan of a ROM mummy illuminates a life from ancient Egypt

8



18



Moving?

Please give us
six weeks notice
of a change of address



NAME

ADDRESS

CITY

PROVINCE

POSTAL CODE

attach
mailing
label
here

ROTUNDA SUBSCRIBERS CONTACT:
Rotunda, 35 Riviera Drive, Unit 17
Markham, Ontario
L3R 8N4
or call (905) 946-0406

ROM MEMBERS CONTACT:
Membership Services,
Royal Ontario Museum,
100 Queen's Park,
Toronto, Ontario, M5S 2C6
or call (416) 586-5700

ROTUNDA

the magazine of the Royal Ontario Museum

PATRONS

His Excellency The Right Honourable Roméo LeBlanc, P.C., C.C., C.M.M., C.D.
Governor General of Canada
Colonel The Honourable Henry N. R. Jackman, C.M., K.St.J., B.A., LL.B., LL.D.
Lieutenant Governor of Ontario

BOARD OF TRUSTEES

Elizabeth Samuel
Chairman

Bluma Appel, C.M.
André Bekerman
Lawrence S. Bloomberg
Josephine Mary Breyfogle
Robert Brown
Frederick Case, Ph.D.
Ann Cameron
Anthony Comper
Jan Copeland
Helen Gardiner

Stanley P. W. Kwan
Susanne Loewen
Leila Joy MacKenzie
Doug Maracle
Brenda McCutcheon
Elizabeth McLuhan
John McNeill, B.Sc., Ph.D.
Raymond Moriyama
J. Robert S. Prichard, M.B.A., LL.B., LL.M.
Barry Connell Steers

Robert E. Barnett, *Secretary*

John McNeill, B.Sc., Ph.D., *President and Director*
David S. Brose, Ph.D., *Vice-President, Collections and Research*
Don Mitchell, *Director, Human Resources*
Michael Shoreman, *Vice-President, Business Affairs and Operations*
Florence Silver, *Vice-President, Exhibits and Marketing*

Yves Savoie, *Executive Director, ROM Foundation*

GENERAL INFORMATION, ROYAL ONTARIO MUSEUM

The public is invited to join the Royal Ontario Museum and to share in its activities.
Members automatically receive *Rotunda*.
For further information write Membership Services, Royal Ontario Museum, 100 Queen's Park,
Toronto, Ontario M5S 2C6, or telephone (416) 586-5700.

The Main Building, 100 Queen's Park: (416) 586-5549
McLaughlin Planetarium, 100 Queen's Park: (416) 586-5736
Sigmund Samuel Canadiana Building, 14 Queen's Park Crescent West: (416) 586-5524
The George R. Gardiner Museum of Ceramic Art, 111 Queen's Park: (416) 586-8080

Published quarterly by the Royal Ontario Museum

© The Royal Ontario Museum, 1995

Printed and bound in Canada

Indexed in the *Canadian Periodical Index* and the *Canadian Magazine Index* and
available on-line in the *Canadian Business & Current Affairs Database*

ISSN 0035-8495

Second class mail registration number 1531

SUBSCRIPTIONS AND SINGLE COPY SALES

Subscriptions \$16.95 (4 issues) plus 7% GST,
outside Canada add \$8.00 for postage and handling; single copies \$4.25 plus 7% GST
All circulation and subscription inquiries should be addressed to *Rotunda*,
35 Riviera Drive, Unit 17, Markham, Ontario, L3R 8N4, (905) 946-0406

ROTUNDA STAFF

Sandra Shaul, *Executive Editor*
Peter Enneson Design, *Design and Production*

ADVERTISING SALES

Jory, High & Associates,
220 Duncan Mill Road, Suite 504,
Don Mills, Ontario M3B 3J5
(416) 447-7999, Fax (416) 447-8034

EDITORIAL AND MARKETING OFFICES

Rotunda, the magazine of the Royal Ontario Museum, 100 Queen's Park,
Toronto, Ontario, M5S 2C6, or telephone (416) 586-5590

Does going to the dentist fill you with fear and loathing? The cover story may change your attitude. Consider Djed-maatesankh whose mummified remains stand encased in an exquisite but delicate fabric car-



tonnage in the ROM's Ancient Egypt and Nubia Gallery. It seems that Djed died at the age of 35 from blood poisoning caused by a huge ruptured cyst in her jaw. Her miserable condition, which would have been easily remedied today, probably started when she was a young girl, and undoubtedly marred an otherwise comfortable life as a temple musician.

Until recently, scant details of her life were known from the hieroglyphs on the cartonnage. Then, Dr. Peter Lewin, a paediatrician at the Hospital For Sick Children in Toronto and an avid amateur of ancient Egypt, contacted Dr. Nicholas Millet, curator in the Egyptian Department, with an offer to CT-scan the mummy. The scans provided insights to researchers from various disciplines—archaeology, pathology, and dentistry—without causing the mummy and its protective casing any harm.

ROM journalist Lee-Anne Jack reveals what was learned and the motives of the researchers, technicians, and police artist in their quest to shed light on the short life of Djed-maatesankh.

While physical remains can expose much about diet, lifestyle, and disease, adornments and other examples of material culture can reveal much about traditions, customs, and beliefs. Using artifacts in the ROM's growing Byzantine collection, curator Paul Denis discusses the transition from Roman to Christian practice in Constantinople, 1400 years ago. He explains that

decorations on the bezels of three Byzantine wedding rings in the ROM's collections reflect the rise of Christianity, however, their formats are obviously based on Roman imperial design found on such common

objects as coins and weights.

Nineteen ninety-five marks the 100th anniversary of the Sino-Japanese War. This war was promoted to the Japanese public through large, finely executed woodblock prints, examples of which are in the Museum's Far Eastern collections. Hugh Wylie, a curatorial assistant in the ROM's Far Eastern Department, looks at the Sino-Japanese War, a critical chapter in Japanese history, through the imagery of these prints.

Turning from human history, have you ever wondered where spiders, those ubiquitous producers of silk and spinners of webs, come from? The fossil record indicates that they first appeared about 390 million years ago; however, they are just one part of a huge group of arthropods called the chelicerates, which began to evolve approximately 515 million years ago, and includes seemingly unrelated creatures such as scorpions and horseshoe crabs. An impressive array of fossil chelicerates is found in the Museum's invertebrate palaeontology collections. Janet Waddington, a curatorial assistant in the Invertebrate Palaeontology Department, explains what is known about the history of spiders and their place in the larger world of chelicerates.

May you enjoy reading this issue of *Rotunda* while waiting to see your dentist or enjoying some leisure time over the holiday season.

Sandra Shaul

Sandra Shaul

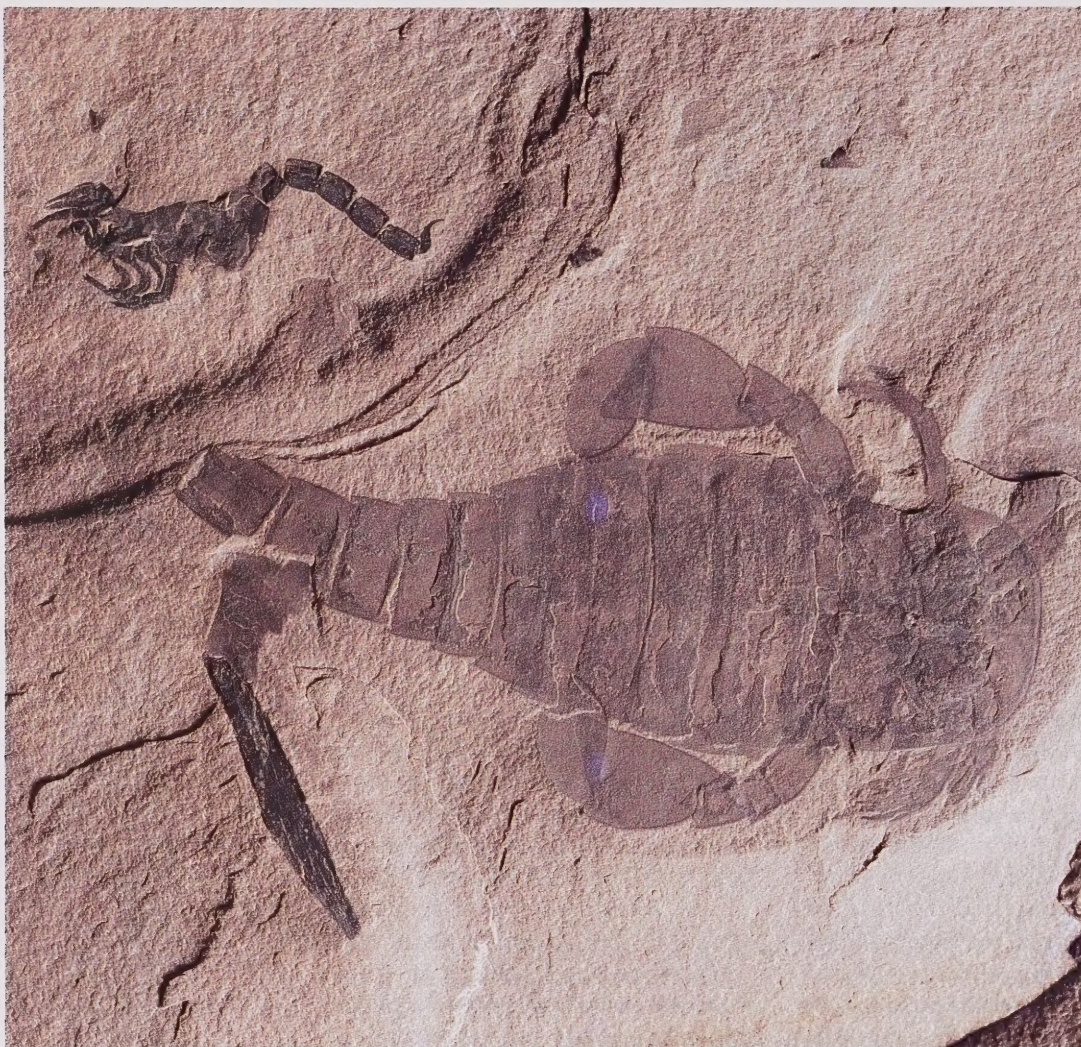
Problem

WITH YOUR
ROTUNDA
SUBSCRIPTION?

Call or write
Anne Nurse
at ROTUNDA,
35 Riviera Dr.,
Unit 17,
Markham, Ontario
L3R 8N4
(905) 946-0406

If you are
a ROM member,
please contact
MEMBERSHIP SERVICES,
Royal Ontario Museum,
100 Queen's Park,
Toronto, Ontario
M5S 2C6
(416) 586-5700.

*We are here
to answer
your questions.*



On a slab of rock recently acquired by the ROM, a small true scorpion appears to have shared the sea with a large eurypterid, a creature that resembled scorpions.

“Sea Scorpions” and Sea Scorpions

There is plenty of precedent for giving sea organisms a common name that relates to terrestrial organisms. Crinoids (relatives of starfish and sand dollars) are called sea lilies; pycnogonids (bizarre creatures with eight legs and not much else) are dubbed sea spiders; sea hares are essentially snails without a shell; and sea cucumbers, which are definitely not vegetables, are animals related to sea lilies.

The eurypterids are extinct fossil relatives of horseshoe crabs. A well-studied and well-known fossil group,

eurypterids lived in sea water ranging from hypersaline (extra salty) to brackish (slightly salty). Many eurypterids had a scorpion-like shape; some had claws similar in appearance to scorpions’ pincers. Consequently eurypterids are often referred to as “sea scorpions.”

However, it is now known that the earliest true scorpions also lived in the sea. In fact, their remains are found in the same rocks as those of eurypterids. In May 1995, the ROM Invertebrate Palaeontology Department acquired a specimen from the Upper Silurian Bertie Formation

(412 million years old) near Mohawk, New York, that shows both eurypterids and a fine scorpion on the same slab. In a fluke of preservation, this little scorpion, *Proscorpius osborni*, looks as if it was caught in the act of lunging at its prey. The presence of the eurypterids, *Eurypterus remipes*, shows that the scorpion lived in the sea. So, what is a sea scorpion?

JANET WADDINGTON

Janet Waddington is a curatorial assistant in the Invertebrate Palaeontology Department, Royal Ontario Museum



Foie Gras, the Cocaine of Cuisine

THE DECIDEDLY OFFBEAT 1973 FILM *La Grande Bouffe* was a dark allegory in which four men retire to a chateau in France to eat and drink themselves to death. One of the men, played by Philippe Noiret, expires devouring a *foie gras* the size of a small bungalow. It was one of the few times in movie history when an audience *envied* a character his death.

Foie gras, the fattened liver of a goose or duck, is the towering icon of Gallic sensuality at the table. Poets call it "the cocaine of cuisine" while hacks feel compelled to describe it as "decadent." Either way, it lives up to the billing.

Although it is a hallmark of the French *gastronomie*, *foie gras* was discovered by those intrepid ancients, the Romans, who fattened their geese on a diet of figs. In the 3rd century, Emperor Heliogabalus,

one of history's legendary gourmands, once ate nothing but *foie gras* for three days, finally deciding enough was enough and feeding it to his dogs.

The Romans taught the barbarian Gauls to drink out of cups instead of skulls and to appreciate spice, wine, snails, and *foie gras*. The Gauls responded by proving natural heirs to Roman culinary finesse. The writer Charles Gerard, in his *L'Ancienne Alsace à table*, referred to the goose as "a living hothouse in which there grows the supreme fruit of gastronomy." Today the French cannot produce enough *foie gras* and are compelled to import the stuff from Austria, Czechoslovakia, Hungary, and Israel.

I wasn't invited to the 2500th anniversary of Imperial Iran in 1971 and missed the Shah's *tour de force* of

roast peacock stuffed with *foie gras*. I was introduced to *foie* years later in the Champagne region of France, paired with sweetbreads in a warm salad. Happily unaware I had consumed a carnival of cholesterol (the insufferable word hadn't yet chewed its way into the gastronomic lexicon), I was delirious for days.

It was years later that I found my way to Perigord, the historic name for the Dordogne region of southwest France and the home, even more than Alsace, of *foie gras*. Perigord ranks as *numéro un* on France's "hit parade culinaire" as compiled by *Time Life*. It is the only place in the world where fresh *foie gras* is sold at roadside stands like corn or blueberries in Canada.

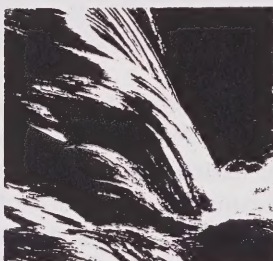
In the town of Sarlat, at the Hôtel-Restaurant St-Albert, proprietor Michel Garrigou serves the silken

LOVE HANDEL'S

HANDEL:

*ROYAL
FIREWORKS
MUSIC*

HANDEL
*Water Music
Wassermusik*



Up to 70 hours of
classical music weekly.

Non-commercial Radio

91.1
CJRT-FM

FOOD AND CULTURE CONTINUED

terrine de foie gras of a lifetime. When the notion of lean cuisine raced through France, Garrigou yawned and waited for it to pass the way of the pterodactyl. "The richness of our product cannot be compromised," he told me. "My customers want to know they've *eaten*."

The French have recipes for *foie gras* the way the Inuit have words for snow. It can be served with grapes and truffles or oysters and crayfish, glazed or potted, steamed, sautéed or fried into fritters. Fast-sautéed in a pan, it is delicately crispy, a lovely golden-brown, and inside, pink, dense, and buttery. As a terrine, it is deep-flavoured, velvety, ready to send the palate reeling, all the more so with a slice of truffle, the incomparable "black queen of cuisine."

Once *foie gras* was a term reserved for goose liver, but nowadays, even in France, chefs have turned to *foie gras de canard*, the liver of the more economical and easier-to-breed duck. In Canada, we no longer look to Europe for our fix: domestic duck liver is being produced both here and in the United States, and while it is less intense than its French counterpart, it is not to be scoffed at.

The prevailing correctness does not embrace *foie*, but then again, Puritanism never has. Sinners, beware: health foodies wag their fingers at its cholesterol content. There is no arguing: *foie* is 110 per cent. Animal rights activists assail the fattening process. Vegetarians are simply appalled. The French regard all the aforementioned as buffoons.

In any event, *foie gras*, garnished with everything from potatoes and salsas to tropical fruits drizzled with flavoured vinegars, is thriving on Toronto menus. In one establishment, duck liver is perfectly plump and pink and boldly drizzled with a meld of carrot, mango, and orange juice. At another, duck liver is poached in rice wine and set atop a pyre of chives.

If you want to purchase some *foie gras* and experiment at home, it is available fresh or vacuum-packed. Top-grade *foie*, recommended for

novices, costs about \$90 per kilo, and is worth every penny.

At least if it's real. I was once invited to an exclusive Toronto club for dinner. One of my companions was passionately French. Scrutinizing a monumentally unappetizing buffet, his eyes unexpectedly lit up. "Foie gras...", he murmured, "foie..." He heaped his plate high. On first bite, his face dropped like a bungee-jumper. It was *foie de mock chicken*. Philippe Noiret would have challenged the chef to a duel.

The following is my wife's recipe, a savoury treat garnished with a tangle of deep-fried leeks. It curls my toes.

**FOIE GRAS
WITH DEEP-FRIED LEEKS AND
RED PEPPER RELISH**

Ingredients

- 250 ml (1 cup) finely diced red pepper
- 15 ml (1 tbsp.) finely diced red onion
- 15 ml (1 tbsp.) raspberry vinegar

- 15 ml (1 tbsp.) sugar
- 60 ml (1/4 cup) water
- 1 ml (1/4 tsp.) salt
- 3 large straight leeks
- 180 ml (3/4 cup) flour
- oil for deep frying
- 225 g (1/2 lb.) cold duck liver
- salt and pepper

Method

Combine the red pepper, onion, vinegar, sugar, water, and salt in a small pot over high heat. Bring to a boil, then reduce heat to medium. Cook, stirring frequently, 10 to 15 minutes until all moisture has evaporated. Cool. Set aside.

Trim the leeks by removing the roots and all the dark green parts. You should have 15 to 20 cm (6 to 8 inch) lengths of white and pale green leek. Cut the leeks in half lengthwise. Separate the leaves. Stack the flattened leaves. Julienne lengthwise into 0.3 cm (1/8 inch) strips. Soak the julienned leeks in ice water 10 minutes. Rinse well.

Spin in salad dryer.

Pour 125 ml (1/2 cup) of the flour into a large plastic bag. Add the leeks. Toss to ensure all leeks are dusted with flour. Preheat oil to a depth of 5 cm (2 inches) in a wok or heavy fry pan over medium-high heat. Fry the leeks 2 to 3 minutes or until they turn golden. Do not brown or they become bitter. Drain on a paper towel. Keep warm.

Slice the duck livers into 8 strips, each 1.5 cm (1/2 inch) thick slices. Season with salt and pepper. Dust lightly with remaining flour.

Preheat a well-seasoned or non-stick pan over medium-high heat. Sauté the liver in two batches 30 seconds to 1 minute per side. Drain on paper towel.

To serve, fill one half of each plate with fried leeks. Arrange the duck liver on the other half. Garnish with red pepper relish. Serves 4.

JEREMY FERGUSON

*Jeremy Ferguson writes
about food and travel*

COMING IN THE NEXT ISSUE OF ROTUNDA

In the February issue of *Rotunda*...

THE MASS EXTINCTION CRISIS

BY NORMAN MEYER

THE NEW T. T. TSUI GALLERIES OF CHINESE ART

BY SANDRA SHAUL

THE SCENT OF SABBATH

BY K. COREY KEEBLE



Royal Ontario Museum
100 Queen's Park
Toronto, Ontario M5S 2C6
(416) 586-5590

Spiders not only have a long history, they are part of a family tree

Spiders make up just one part of a huge group of arthropods called chelicerates, which includes among others such familiar creatures as scorpions, mites and ticks, and "horseshoe crabs," as well as the extinct eurypterids or "sea scorpions." Only 62 mm long, excluding its outstretched "claws," the fossil *Sanctacaris uncata* represents the oldest known probable chelicerate. This specimen was found in the Middle Cambrian Stephen Formation, Yoho National Park, British Columbia.

ERA	PERIOD	AGE
Cenozoic	Quaternary	1.7
	Tertiary	65
Mesozoic	Cretaceous	140
	Jurassic	208
	Triassic	250
Palaeozoic	Permian	290
	Carboniferous	360
	Devonian	410
	Silurian	438
	Ordovician	510
	Cambrian	545
Precambrian		



515 MILLION YEARS

*There came a great spider, that sat down beside her
and frightened Miss Muffet away.*

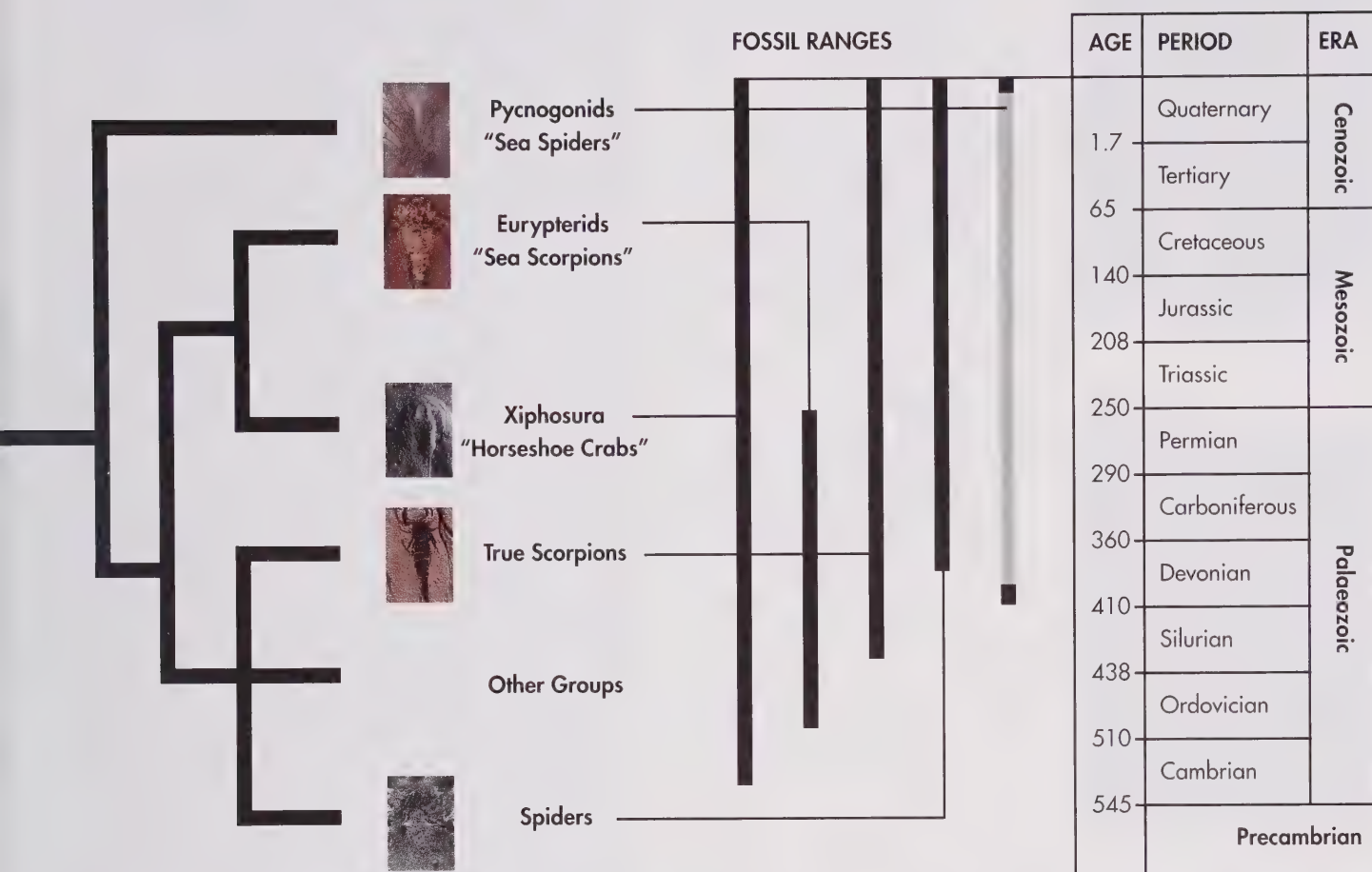
SPIDERS ARE OFTEN UNFAIRLY MALIGNED AND Unappreciated. In this well-known nursery rhyme, a spider is portrayed as the intruder; however, the first spiders appeared and adapted to life on Earth more than 390 million years ago, long before Miss Muffet and her ilk had evolved to sit on tuffets. Factor in all the spiders' relatives and the

truth is that Miss Muffet should view these animals with admiration rather than fear.

Spiders make up just one part (albeit by far the largest) of a huge group of arthropods called the chelicerates, which includes among others such familiar creatures as scorpions, mites and ticks, and "horseshoe crabs," as well as the extinct eu-

*Janet Waddington is a curatorial assistant
in the Invertebrate Palaeontology Department,
Royal Ontario Museum*

with an astonishing number of branches JANET WADDINGTON



OF ARACHNOHISTORY

rypterids or "sea scorpions." These animals have a fascinating legacy in the fossil record that includes some familiar-looking forms along with some that are very bizarre.

The chelicerates are divided into two classes. The smaller class, called the merostomates, is represented today by only five species of horseshoe crab (which are not really crabs). These creatures live in shallow coastal marine waters, although some

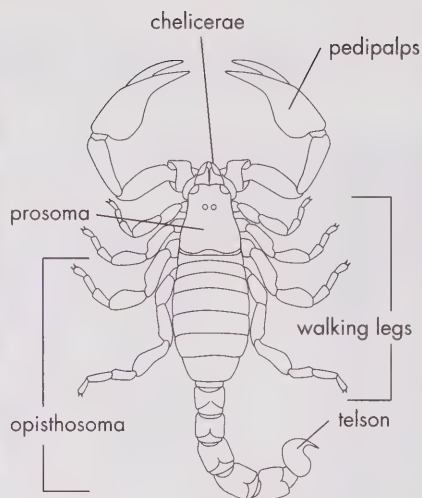
ancient horseshoe crabs may have ventured onto land. Merostomates are known mostly through the fossil record—especially the long-extinct eurypterids or sea scorpions, so named for their superficial resemblance to true scorpions.

The other class, the arachnids, includes scorpions, spiders, and their immediate relatives. This is a huge class, exceeded in number of species only by the class of insects. The 1200 known species of true scor-

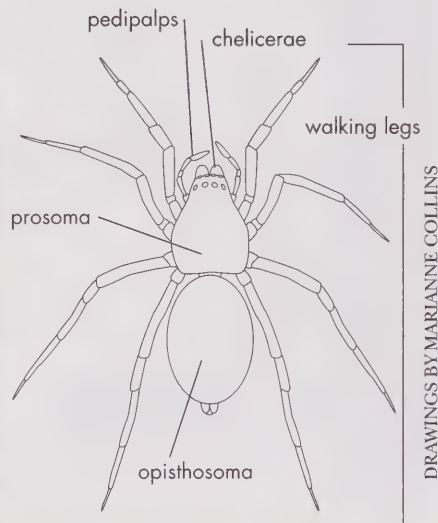
PHOTOGRAPH BY BRIAN BOYLE

Spiders!, an exhibition organized by the National Museum of Natural History, Smithsonian Institution, is on display at the Royal Ontario Museum until 14 January 1996.

Scorpion



Spider



DRAWINGS BY MARIANNE COLLINS

WHAT ARE ARTHROPODS?

Arthropoda (Gr. *arthron* joint plus *podos* foot, the jointed-legged animals)

Arthropods are animals characterized by a bilaterally symmetrical, segmented body divided into distinct regions; paired jointed limbs specialized for different functions such as feeding, locomotion, and respiration; and a chitinous outer cuticle that serves as an exoskeleton (external skeleton) to provide support and protection for the soft body parts.

A vast array of creatures inhabiting almost every conceivable niche on dry land and in the water is classified as arthropods. Arthropods include insects, spiders, scorpions, millepedes, centipedes, wood lice, lobsters, crabs, barnacles, and a whole host of others. Their importance to the rest of the living world is incalculable—as pollinators of plants, food to countless other animals, carriers of disease, destroyers of food crops, and “recyclers” of dead plant and animal material.

The largest phylum (major subdivision) in the animal kingdom, arthropods comprise a whopping 875,000 (85 per cent) of an estimated 1,032,000 species of animals known and described by science. Of these,

THE FOSSIL RECORD IS LIKE A TORN OLD BOOK. PAGES CAN USUALLY BE PUT IN ORDER BUT THE NUMBER

pions living today inhabit a wide variety of terrestrial environments, from deserts to tropical rain forests. Spiders, with more than 35,000 known living species, have successfully exploited almost all terrestrial habitats as well as a number of freshwater and intertidal areas. They display a staggering array of lifestyles while maintaining a fairly standard appearance. Other arachnids, including mites and ticks, pseudoscorpions, whip scorpions, and daddy longlegs, exhibit similar diversity in lifestyle and habitat.

There are hundreds of species of known fossil chelicerates, but their re-

mains are comparatively rare; most are represented by only a few specimens, in striking contrast to the tremendous abundance of living arachnids, many more of which remain to be discovered and named. This does not necessarily mean that chelicerates were rarer in the past. The rarity of fossils is almost certainly due to the fact that arachnids and other chelicerates are not good candidates for preservation. Their bodies are composed of a thin unmineralized organic cuticle that usually disintegrates rapidly after the animal moults or dies. Preservation of chelicerates that live on land is further impeded

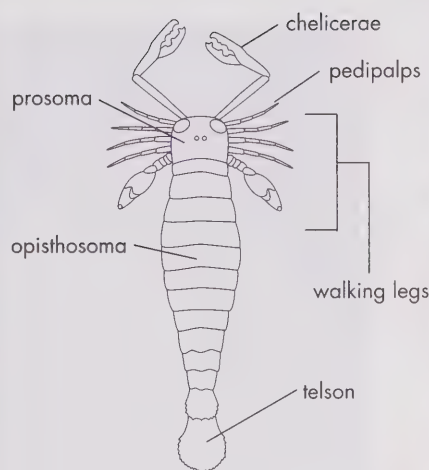
more than 750,000 (85 per cent) are insects and 73,000 (8 per cent) are spiders, scorpions, and their relatives. And it has been estimated that there are probably further tens of millions of arthropods not yet discovered and named.

Just to put the numbers into perspective: vertebrates make up only 4 per cent of known living species, and mammals, with about 4000 species described, comprise a paltry 0.4 per cent.

These statistics apply only to living animal species. Considering that the fossil record of arthropods extends back at least 545 million years, it is impossible even to estimate the numbers of species that must have evolved and died out over time.

WHAT MAKES A CHELICERATE?

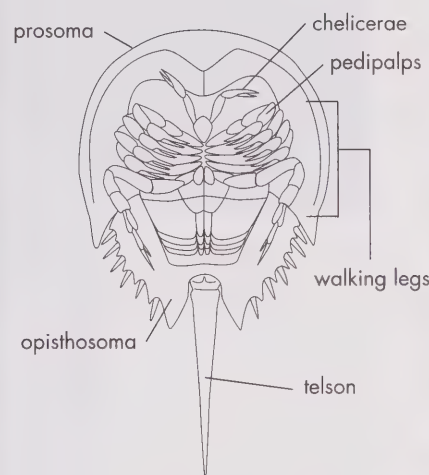
- combined head and thorax (prosoma)
- abdomen (opisthosoma)
- six pairs of "legs" attached to prosoma:
 - the chelicerae may look like tiny jaws or fangs, or may be elongate pincers;
 - the pedipalps may be pincers, feelers, or may look like the remaining four pairs of legs;
 - legs for walking or swimming
- tail or telson (optional)



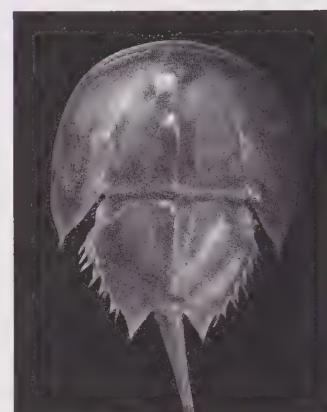
Eurypterid



ILLUSTRATION BY PETER BUERSCHAPER



Horseshoe Crab



INVERTEBRATE PALAEONTOLOGY DEPT., ROM

MISSING MAY BE IMPOSSIBLE TO DETERMINE AND THEIR INFORMATION IMPOSSIBLE TO RETRIEVE

ed by the fact that the environment in which they live is not usually one in which they are rapidly buried after death. Rapid burial is one of the conditions necessary for fossilization.

The fossil record is like a torn old book. Pages can usually be put in order but the number missing may be impossible to determine and their information impossible to retrieve. Most knowledge of ancient chelicerates comes from lagerstätten deposits—rare and extraordinary “windows into the past” in which spectacular fossils of soft-bodied organisms are preserved [see “Paradise Revisited” by Desmond

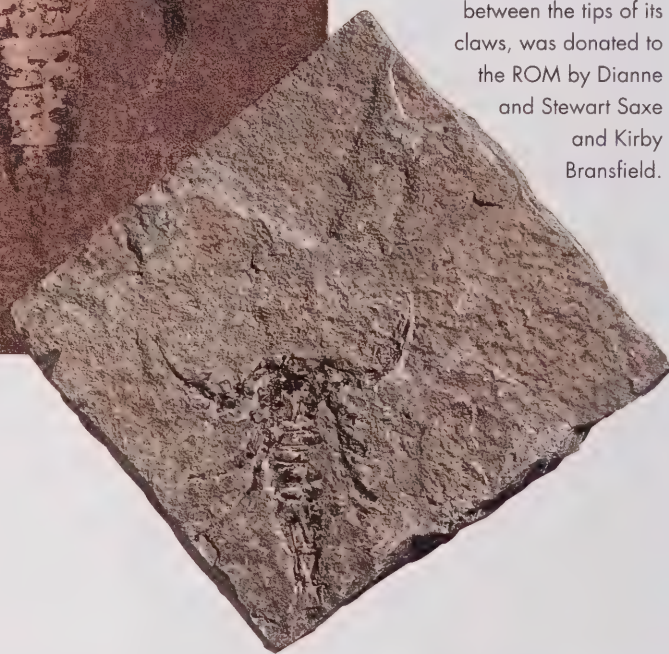
Collins. *Rotunda*, vol. 19, no. 1 (Summer 1986), pp. 30-39; and “What Were the First True Terrestrials?” by Desmond Collins, *Rotunda*, vol. 25, no. 2 (Fall 1992), pp. 24-29]. As understanding of these treasure troves of ancient life increases, there are bound to be new discoveries that will push back even further the origins of spiders and their relatives and reveal many more forms still hidden from view.

One characteristic of arthropods that makes them so interesting and popular when fossilized is that their supporting structure is on the outside. Dinosaur remains are mostly scattered and incomplete

ERA	PERIOD	AGE
Cenozoic	Quaternary	1.7
	Tertiary	
Mesozoic	Cretaceous	65
	Jurassic	140
	Triassic	208
		250
Palaeozoic	Permian	290
	Carboniferous	360
	Devonian	410
	Silurian	438
	Ordovician	510
	Cambrian	545
Precambrian		



At least four different types of eurypterids have been found in the Eramosa Formation near Warton, Ontario. The 23-cm-long specimen of the eurypterid *Kokomopterus* was donated to the ROM by Harold Stobbe.



The oldest (420 million years old) fossil true scorpion (below) from Canada is an undescribed species from the Eramosa Formation. Although the fossil scorpions are found in rocks thought to be of marine origin, the structure of their legs suggests that they may have walked on land. This specimen, which measures 85 mm between the tips of its claws, was donated to the ROM by Dianne and Stewart Saxe and Kirby Bransfield.

DISCOVERED IN THE BURGESS SHALE, SANCTACARIS UNCATA, DUBBED "SANTA CLAWS" BECAUSE OF ITS LARGE GRASPING

bones that require scientists and artists to reconstruct the skeleton, and then to imagine how flesh and skin should be added to create an image of the actual animal. However, if anything, it is the "skin" or cuticle of arthropods that is preserved, so that all or part of the animal's outer form is immediately apparent, making it much easier to visualize.

Although different chelicerates may vary widely in overall appearance, they all have features in common that show they are related. A chelicerate building kit would include a combined head and thorax (prosoma), an abdomen (opisthosoma), and six pairs of "legs," one or two pairs of which might look like claws or jaws (these are called the chelicerae and the pedipalps). At least four of the pairs of legs are used for walking or swimming. Chelicerates do not have antennae, although there might be a tail (telson). The legs attach to the underside of the prosoma, with the jawlike ones in front, while the telson, if there is one, extends from the back end of the abdomen. The shapes and sizes of these building blocks determine the type of chelicerate.

A good representation of fossil chelicerates, illustrating the amazing diversity of

PHOTOGRAPHS BY BRIAN BOYLE



The Late Silurian Bertie Formation (412 million years old) outcropping in Ontario and New York State contains an amazing variety of fossil chelicerates, including those pictured here. *Proscorpius* (left) is a true scorpion measuring 45 mm in length, found near Mohawk, New York. Its body shape resembles that of the eurypterids (below left), also found near Mohawk, which were purchased by the ROM with a grant from the Minister of Communications under the terms of the federal Cultural Property Export and Import Act. *Bunaia* (below right) is a xiphosuran, an ancient relative of horseshoe crabs. Measuring 28 mm, this specimen was found near Fort Erie, Ontario, and donated to the ROM by Andrew Milner.



AGE	PERIOD	ERA
1.7	Quaternary	Cenozoic
65	Tertiary	
140	Cretaceous	Mesozoic
208	Jurassic	
250	Triassic	
290	Permian	Palaeozoic
360	Carboniferous	
410	Devonian	
438	Silurian	
510	Ordovician	
545	Cambrian	
	Precambrian	

CLAWLIKE LIMBS, MAY TURN OUT TO BE THE EARLIEST ANCESTOR OF SPIDERS, SCORPIONS, AND ALL THEIR RELATIVES

these extremely successful animals through time, forms part of the permanent collection of the ROM's Invertebrate Palaeontology Department. If Miss Muffet had stayed around she might have heard a spellbinding story from the spider.

The oldest known probable chelicerate was discovered in 1983 by a ROM field party led by Desmond Collins in Yoho National Park, British Columbia, near the famous 515-million-year-old Burgess Shale. This fossil, dubbed "Santa Claws" because of its large grasping clawlike limbs, has since been formally named *Sanctacaris uncata*.

What makes *Sanctacaris* a chelicerate?

Like chelicerates it has two distinct body parts, no antennae, and at least six pairs of limbs. Unlike most other known chelicerates, which tend to use only the first one or two pairs of "legs" (the chelicerae and the pedipalps) for feeding, the first five pairs of *Sanctacaris* limbs are similar to one another and appear to have all been used for grasping prey. Nevertheless, *Sanctacaris* appears to have more in common with chelicerates than with any other known group of arthropods, and so may turn out to be the earliest ancestor of spiders, scorpions, and all their relatives.

Before the discovery of *Sanctacaris*, the

Palaeolimulus is an early horseshoe crab. This 81-mm specimen from the Lower Carboniferous Heath Formation (330 million years old) at Bear Gulch, Montana, was purchased by the ROM with a grant from the Minister of Communications under the terms of the federal Cultural Property Export and Import Act.

ERA	PERIOD	AGE
Cenozoic	Quaternary	1.7
	Tertiary	
Mesozoic		65
	Cretaceous	140
	Jurassic	
	Triassic	208
Palaeozoic		250
	Permian	290
	Carboniferous	
		360
	Devonian	410
	Silurian	
	Ordovician	438
Precambrian		510
		545



The 49-mm-long horseshoe crab (above) is from the Upper Carboniferous Francis Creek Shale in the Mazon Creek area of Illinois. It was purchased with the assistance of the Royal Ontario Museum Foundation.

SCORPIONS MAY HAVE VENTURED FROM THE SEA ONTO LAND BY THE LATE SILURIAN PERIOD ABOUT 400 MILLION

oldest known fossil chelicerates were the merostomates. Among these were the eurypterids, many of which had a very scorpion-like shape, with a relatively small "head" and an elongate body that abruptly narrowed about halfway back. In some eurypterids the chelicerae were long grasping pincers, while in others they were tiny and ineffectual-looking. In place of the scorpion's stinger, the tail of a eurypterid was either a long spike or a flat, rounded paddle.

The environments that ancient animals inhabited can be determined by the type of rocks encasing the fossils. Eurypterids

are often found in fine-grained limestones or dolostones, suggesting that they lived in marginal marine to brackish water habitats such as nearshore lagoons. A few may even have ventured into fresh water. Some grew to huge size; species of *Pterygotus* apparently reached lengths of up to three metres. With its long spiny pincers *Pterygotus* must have been a formidable predator in the Silurian seas, 412 million years ago.

Another group of merostomates, the xiphosurans or "horseshoe crabs" have representatives living today. Xiphosurans have a greatly enlarged horseshoe-shaped prosoma which makes them very different

PHOTOGRAPHS BY BRIAN BOYLE



These spiders and scorpion from the Mazon Creek area of Illinois, are a small sample of the more than 100 species of chelicerates described from the Carboniferous period, 300 million years ago. They lived in a deltaic swamp where they could feed on the lush plant life and a rich fauna of small terrestrial invertebrates, including insects. The fossils are preserved as impressions in ironstone nodules found within shale beds among rich coal seams. These specimens were purchased by the ROM with a grant from the Minister of Communications under the terms of the federal Cultural Property Export and Import Act and the assistance of the Royal Ontario Museum Foundation.

AGE	PERIOD	ERA
1.7	Quaternary	Cenozoic
65	Tertiary	
140	Cretaceous	Mesozoic
208	Jurassic	
250	Triassic	
290	Permian	Palaeozoic
360	Carboniferous	
410	Devonian	
438	Silurian	
510	Ordovician	
545	Cambrian	
	Precambrian	

YEARS AGO, THERE THEY MUST HAVE FOUND CREATURES TO EAT, ALTHOUGH THESE HAVE YET TO BE IDENTIFIED

in appearance from the other chelicerates. They have to be turned over before we can see the similarities in the legs and other structures. Horseshoe crabs living today are, superficially at least, very similar to even the earliest fossil members of the group, and so have earned the nickname "living fossils."

Eurypterids have been called "sea scorpions," but the first true scorpions also lived in the sea. Their fossil remains have been found in the same rocks as eurypterids, more than 412 million years old. Even the earliest known scorpions had a sharp curved telson with a poison gland,

and pedipalps in the form of nasty predatory pincers. Having developed in the sea, scorpions may have ventured onto land as early as the late Silurian period about 410 million years ago. As they were undoubtedly carnivores, there must have been other meeker, milder creatures aplenty already on land for them to eat, although these have yet to be positively identified in the fossil record. This prey was probably soft-bodied; any remains would normally have rotted away before they could be buried and preserved. Scorpions came onto land to stay a long time ago. The last fossil scorpions that were definitely aquatic date

ERA	PERIOD	AGE
Cenozoic	Quaternary	1.7
	Tertiary	
Mesozoic		65
	Cretaceous	140
	Jurassic	
	Triassic	208
Palaeozoic		250
	Permian	290
	Carboniferous	
		360
	Devonian	410
	Silurian	438
	Ordovician	510
	Cambrian	545
Precambrian		

The survival of spiders is due, to a large extent, on their ability to produce silk and spin webs. This tiny spider, with a head and torso measuring only 3 mm, was preserved in amber 25 million years ago. It was found in the Dominican Republic.



SPIDERS FIRST APPEARED ON LAND IN THE EARLY DEVONIAN PERIOD, ABOUT 390 MILLION YEARS AGO. BY THE LOWER

back 300 million years to the Carboniferous period. Fossil scorpions more recent than that, although rare, all lived on land.

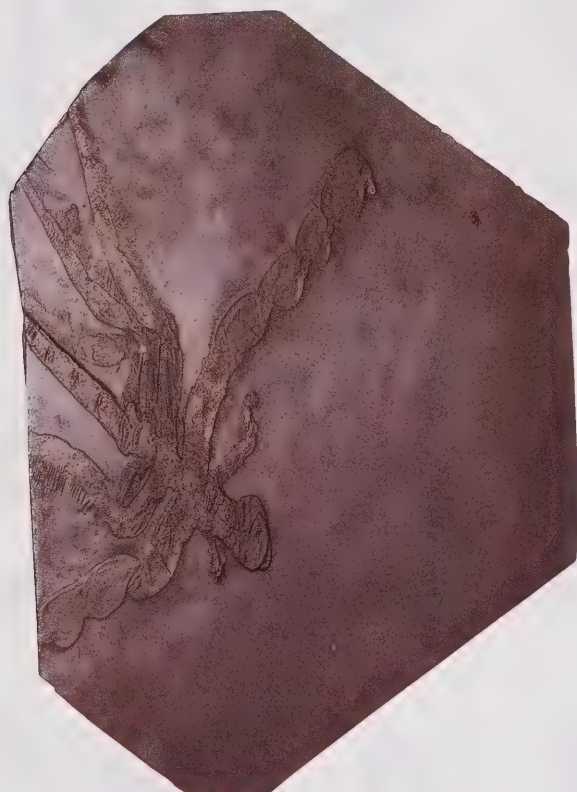
Shortly after the scorpions, spiders appeared on land in the early Devonian period, about 390 million years ago. There may even have been tuffets back then, as land plants were well established, but no Miss Muffet was to be seen for eons (or at least eras). The fossil record shows that by the lower Miocene epoch, 20 million years ago, virtually all families of spiders now living were represented. Still no Miss Muffet.

Everyone knows what a spider looks

like. The body is divided into a prosoma and a fleshy opisthosoma that is attached to the prosoma by a narrow pedicel, giving the spider its distinctive "waist." The chelicerae have developed into curved sharp fangs, usually bearing a pore from a poison gland. In many species of spiders the bases of the second set of legs, the pedipalps, have developed into strong jaws for grinding food, while the short limbs themselves extend forward as "feelers." The four remaining pairs of limbs are invariably legs for walking or jumping.

Probably the best known characteristic of spiders, other than their eight legs, is

Palaeoisopus, a pycnogonid or “sea spider,” was found in the Lower Devonian Hunsrück Shale of Germany. It has a leg span of more than 26 cm. Such are the vagaries of preservation that there are no known fossil sea spiders of dating between the time of this specimen 390 million years ago and those of the present day.



AGE	PERIOD	ERA
1.7	Quaternary	Cenozoic
65	Tertiary	
140	Cretaceous	Mesozoic
208	Jurassic	
250	Triassic	
290	Permian	Palaeozoic
360	Carboniferous	
410	Devonian	
438	Silurian	
510	Ordovician	
545	Cambrian	
	Precambrian	

Spiders! is circulated by the Smithsonian Institution Travelling Exhibition Service. *Spiders!* is made possible through the generous support of Marvel Entertainment Group, Inc. Additional funding was provided by the Smithsonian's Special Exhibition Fund. The Royal Ontario Museum gratefully acknowledges the donation of creative services from its advertising agency, Roche, Macaulay and Partners. Media partners are The Toronto Sun and TVO.

MIOCENE EPOCH, 20 MILLION YEARS AGO, VIRTUALLY ALL FAMILIES OF SPIDERS NOW LIVING WERE REPRESENTED

their ability to produce silk and spin webs. Fossil spider webs have been found preserved in amber from the Baltic and the Dominican Republic, showing that this ability was fully developed at least 30 million years ago. A fossil spider of Devonian age (370 million years) from Gilboa, New York, shows apparent spinnerets, suggesting that even the earliest spiders could produce silk.

An account of fossil spiders would not be complete without mention of the bizarre pycnogonids or “sea spiders,” so named because of their superficial similarity to true spiders with four pairs of long

legs and a small body. Sea spiders appear to be almost all leg; in fact most of their internal organs are located in their legs. The jury is still out on whether they are chelicerates. These strange animals are known only from living species and from a few 390-million-year-old Devonian fossils. Living pycnogonids inhabit the sea from shallow intertidal areas to abyssal depths; their leg spans range from a few millimetres to more than 70 centimetres.

One can only pity the Miss Muffets of this world while admiring spiders. Their long and complex ancestry, incredible diversity, and adaptability are truly amazing. ♡



SC

Decorations on Byzantine wedding rings

MARRIAGE BYZANTINE

The Royal Ontario Museum greatly appreciates the generous and important donation by Joey and Toby Tanenbaum of 200 Byzantine artifacts

MARRIAGE DURING THE EARLY Byzantine era was usually a civil ceremony in the Roman tradition. When two families decided to be joined through marriage, 1400 years ago in Constantinople, the heads of the families agreed to a betrothal contract, which would have included a betrothal ring, gifts of jewellery and clothing, and money for the bride-to-be. Then the young man and his future wife announced before family and friends their intention to wed.

Some time later the marriage took place in the home of the bride's father,

who conducted the ceremony. He offered blessings and placed crowns on the heads of the bride and groom. The couple then exchanged wedding rings, which were worn on the third finger of the left hand because it was believed that a small nerve in this finger was connected directly to the heart. Following the ceremony, the couple and their guests enjoyed a feast.

However, there were also signs, at this time, that this secular ceremony was gradually being transformed into a Christian rite. With increasing frequency, Christian families invited a priest or bishop to the home to perform the ceremony instead of

Paul Denis is a curatorial assistant in the Greek and Roman Department, Royal Ontario Museum

ENES OF



are a window to society and marriage more than 1000 years ago

AGE IN

PAUL DENIS

TIUM



the bride's father. By the 9th century, this optional practice had become obligatory, as marriage came under the official jurisdiction of the Church. An imperial edict, *Novella 89*, issued by Emperor Leo VI the Wise (886-912), decreed that the blessing of a priest was necessary to make a marriage legal.

Weddings are only one example of how Christian ritual derived from Roman secular culture as Christianity became more dominant in the centuries that saw the decline of the Roman Empire. Wedding adornments illustrate this transition.

Early Byzantine betrothal rings have yet to be identified with certainty; they may have been undistinguished bands of metal,

as was customary in Roman society. Pliny the Elder wrote in his *Natural History* that betrothal rings should be made from a simple band of iron. However, a small number of Early Byzantine wedding rings have survived, and the ROM is fortunate to own two as well as the bezel from a third, all dating from the 6th to 7th century. The bezels of these rings display images associated with marriage and show the transition from Roman to Christian practice.

The first ring is an outstanding example of Byzantine craftsmanship. Made of gold, it has a thick circular bezel attached to a very stout hoop. On the finely engraved bezel, a cross is placed between busts of the groom and bride. A wedding crown, rendered as a

PHOTOGRAPHS BY BRIAN BOYLE

The bezels of gold wedding rings show the transition of marriage from a Roman to a Christian rite. Their formats were inspired by objects linked to the Imperial court



A cross placed between the bride and groom and the word *omonoia* are found on the first bezel (top left). On the second bezel (top right), a small bust of Christ floats above the couple and the inscription *theou* is below. The third bezel (top, facing page) shows a full figure of Christ touching the shoulders of the bride and groom.

semi-circular object, floats above their heads. The word *omonoia*, meaning concord or harmony, is placed just below the couple.

This image expresses religious beliefs connected with marriage. The crowns, a Roman tradition, were reinterpreted by the early Church fathers to symbolize the triumph over sensual pleasure. The combination of the cross, associated with Christ, with the inscription *omonoia*, conveyed the message that harmony in marriage is a gift from God. This theme is more clearly presented on the second ring, where in addition to the crowned couple there is a small bust of Christ and the inscription *theou* above the cross. *Theou* means "of God"; therefore the sentiment expressed is "concord of God."

The compositions of the scenes on the wedding rings are similar to images found on objects linked to the Imperial court. For example a bronze weight dated to the 5th century shows the frontal busts of two co-emperors, side by side, inlaid with silver. On a gold solidus, issued during the reign of the Emperor Heraclius (610-641), the frontal busts of the emperor and his son frame a small cross. The triangular composition of the ROM's second ring also occurs on a 6th-century blue-glass weight, which depicts the emperor at the apex and two court officials below. Imperial secular scenes were easily modified to suit religious purposes.

The third ring in the ROM's collection, of which only the bezel remains, shows

The word *omonoia* on a wedding band expressed the Roman sentiment of harmony whereas theou expressed the Christian sentiment of concord with God



another variation of the wedding: Christ standing with his arms outstretched touches the shoulders of the groom on the left and the bride on the right. The engraved diagonal line above their heads signifies the wedding crowns. *Omonoia* is engraved below the ground line. Precedents for this format are found on Roman coins.

During a Roman wedding the *dextrarum iunctio*, joining of the right hands, was an important part of the ceremony because it represented a pledge of faith made by the couple to each other. On a denarius issued around 202–205, Emperor Caracalla is shown clasping the hand of his wife Plautilla. The legend on the coin states, “to eternal concord,” thus emphasizing the harmony between the couple, an important

message easily transmitted throughout the Empire via the medium of coins.

A bronze coin struck in 219 shows the goddess Concordia standing between Emperor Elagabalus and Empress Julia Paula. Concordia’s raised arms rest on the shoulders of the couple as they hold hands. The goddess symbolically joins them in marriage. On the wedding ring Christ replaces the Roman goddess. He brings the bride and groom together and bestows upon them blessings, crowns, and the gift of *omonoia*.

The images on the rings illustrate the importance of Christ’s divine presence at a wedding. His role was gradually being represented by the priests officiating at the ceremonies. Fifth-century Byzantine wed-

Compositions of figures such as those on a bronze weight, glass weight, and gold solidus of Heraclius (facing page) as well as coins featuring Emperor Caracalla and his wife Plautilla (above left) and Emperor Elagabalus and Empress Julia Paula (above right) influenced the designs of the bezels.

A close look at the couples portrayed on the bezels of wedding rings reveals a number of details about personal adornment associated with marriage



On his wedding day, the groom may have used a gilt bronze crossbow fibula to fasten his cloak and worn his finest gold belt buckle (above). Betrothal gifts to the bride could have included (centre, clockwise) a gold hair ornament, one or more gold crosses, a pair of gold earrings, and gold solidi (coins).

ding rings lack an image of God on their bezels, and so it can be assumed that His appearance on the bezels of 6th- to 7th-century rings reflects the increasingly religious nature of the wedding ceremony.

A close look at the wedding couples portrayed on the bezels reveals a number of details about personal adornment. The groom would have fastened his *chlamys*, or cloak, over his right shoulder, using a crossbow fibula much like an early 5th-century gilt bronze piece from the ROM. His tunic was belted, and since this was one of the most important days of his life, he would have worn his finest belt buckle. This might have resembled a superbly crafted late 6th-century example also at the ROM, which has an elegantly shaped plate made from a



thick sheet of gold exquisitely decorated in repoussé. The buckle is formed by two trefoils that frame the heavy tongue. It exemplifies Byzantine goldsmithing at its best.

The bride's wedding apparel is enhanced by a necklace and pendant earrings. Her necklace may have been similar to necklaces in the Museum's collections. The first is a simple strand of green beryls; the second is a more elaborate piece consisting of alternating pearls and lapis lazuli stones capped at each end with gold. Her pendant earrings may have consisted of a long suspension hoop attached to a beaded, open-work disc that had a pair of amethyst stones hanging from it. This style was very popular during the 6th century.

Earlier, as part of her betrothal gift, the

Whereas Romans believed that a harmonious marriage was the result of personal virtue and effort, Byzantines depended upon grace, which was a gift from God



bride-to-be received money and jewellery. The Museum's gold solidi and gold jewellery, dating from the 6th to the 7th century, are examples of the type of presents she would have received. The solidi were struck with portraits of the ruling emperors on one side and Christian symbols on the other.

Made from precious metal and decorated with scenes originating at the Imperial court, the rings and jewellery were probably created for a wealthy and powerful clientele. Of all the splendid Byzantine adorn-

ments and coins in the ROM's collections, the three rings are the most revealing of society and marriage more than 1000 years ago. They illustrate how the values, beliefs, practices, and rituals of different cultures influence each other and evolve over the decades and centuries. Romans held the pragmatic belief that a harmonious marriage was the result of their own virtue and personal effort, while the Byzantines believed that harmony in marriage came through grace, which was a gift from God. ♡

On her wedding day, the bride may have adorned herself with jewellery (above), such as pendant earrings, a necklace of beryl stones, or a necklace of lapis lazuli stones and pearls.

Page 20: Top row (left to right): Gift of Joey and Toby Tanenbaum, Gift of the Government of Ontario and the ROM Membership, Bottom row (left to right): Gift of Joey and Toby Tanenbaum, purchase, Gift of the Government of Ontario; page 21: Top: Gift of Joey and Toby Tanenbaum, Bottom (left to right): Gift of the ROM Reproductions Fund, reproduced with permission of Freeman & Sear; Page 22 and Pages 22-23: Gift of Joey and Toby Tanenbaum; Page 23: Top: Gift of the Government of Ontario and the ROM Membership, Middle: purchase, Bottom: Gift of Joey and Toby Tanenbaum

IMAGES OF

Woodblock prints of the 1894-95

*Sino-Japanese War are a
vivid reminder of a critical
chapter in Japanese history*

HUGH WYLIE

IN 1995, THE 50TH ANNIVERSARY OF THE END OF WORLD War II prompted the Japanese people and their government to rethink, with a great deal of soul-searching and no less controversy, the events surrounding that mid-20th-century war and its legacy, which continues to affect negatively Japan's relations with other Asian countries. The year also marked the centenary of the conclusion of Japan's first modern war, the Sino-Japanese War, which was declared on 1 August 1894 and officially ended on 17 April 1895. It was fought primarily to challenge China's suzerainty over Korea.

Intermittently from the time of the Chinese Han dynasty (206 BC-AD 220), the Korean peninsula had been subject, in varying degrees, to China's influence and for several long periods to Chinese political and economic domination. After the 1895 victory, Japanese power and determination to dominate Korean affairs gradually increased, culminating in the outright annexation of Korea in 1910. There is no conclusive evidence, however, that annexation was a long-term policy of the Japanese government.

The 1895 Treaty of Shimonoseki officially ended the Sino-Japanese War and required that China recognize the independence of Korea, pay a large indemnity, open four ports to Japanese trade, allow Japanese to manufacture locally in China, and cede Chinese territory—Taiwan, the Pescadores, and the Liaodong Peninsula—to Japan. Various European nations had been making territorial inroads on China or China's tributary states beginning with the British colonization of Hong Kong after their 1842 victory in the Opium War. Japan had been unable to emulate fully imperialist expansion until 1895 when it proved itself equal to Western nations in waging war.



The distressing incident of Mr. Kim Ok-kyun (Meiji period, dated 1894) by Utagawa Kokunimasa (active 1887-1912). The woodblock-print triptych portrays the assassination of Kim by Hong Chong-wu, in Shanghai. Gift of Leo Farber.

Nevertheless, following the peace treaty the Triple Intervention of Russia, France, and Germany "advised" Japan to give up territory ceded to it on the Liaodong Peninsula, an outcome much to Russia's advantage in pursuing its goals in East Asia. Thus, despite Japan's victory on the battlefield, her humiliation

Hugh Wylie is a curatorial assistant in the Far Eastern Department, Royal Ontario Museum

IMPERIALISM



in the aftermath helped pave the way for a second conflict over Korea, the Russo-Japanese War (1904-05), in which Japan again prevailed.

Both wars are almost forgotten by today's Japanese, partly because of broad disillusionment with militarism following the Second World War. However, late 19th-century Japanese artists illustrated the war with China in more than 1000 designs for woodcuts and lithographs, which were published in abundance. Widespread circulation of the prints fueled patriotic fervor. This art was often propagandistic, celebrating Japanese heroes and, in all but a few examples, denigrating the Chinese. The

prints also disseminated information about the war, often with the same rapidity as newspaper reports. Some prints propagated disinformation as well, partly because most of the artists did not visit the front but spent the war months busily working in Tokyo.

Romanticizing heroes of the war, the prints easily captured popular imagination. As well, the relatively short duration of the first two modern wars, with their successful battles, encouraged enthusiastic public support. The general populace could relate to the type of soldier glorified in the prints. For the first time troops included all social classes, not just the samurai class, which had ruled supreme for centuries until the Meiji government abolished the traditional class system. The

Sino-Japanese War was modern warfare fought by a new army of conscripts.

Many of the woodblock prints, despite their disturbing subject matter, are beautifully designed and executed. In many ways they follow in the tradition of Edo-period (1603-1867) *ukiyo-e* warrior prints; in other ways they also mark the end of traditional *ukiyo-e*. At a time when Japan's modernization allowed it to join Euro-

process, including the commercial distribution.

The artist, or designer, made several ink sketches of the composition before the final sketch was turned over to the block carver. By necessity this final sketch was destroyed when the block was carved; it was pasted face-down on a block of very hard wood and the areas between the lines were removed with chisels, leaving raised areas of wood, which were then inked. A sheet of moist-



pean nations in Asian imperialist endeavours, the country was also questioning continued European imperialism in Asia. The Sino-Japanese War prints helped to create a strong and proud new national image for the Japanese people. Today the prints are vivid graphic reminders of a particular period in Japanese history.

The late 19th-century woodblock prints of the modern foreign wars were created by use of the same production methods developed for *ukiyo-e* in the 17th and 18th centuries. A designer, a block carver or engraver, and a printer each contributed his specialized skill, coordinated by a publisher who supervised the whole

A skirmish at Seoul (Meiji period, dated August 1894) by Utagawa Kokunimasa (active 1887-1912). Korean palace guards resist the Japanese troops on 23 July 1894 in this woodblock-print triptych. Gift of Leo Farber.

ened paper, made from pulp of the mulberry tree—not “rice paper,” as Japanese hand-made paper is so often mistakenly designated—was then laid on the block and rubbed with a pad called a *baren*, by the printer. Proofs pulled from this first block, or key-block, could then serve as guides for carving the additional blocks used to print broad areas of colour.

The result was a full-colour print with colours trans-

ferred to the paper by as many as ten or more woodblocks inked with different colours. Each edition usually comprised a day's printing of completed prints—about 200 to 250 copies. However, more than 1000 impressions could be taken from a set of blocks before the wear on the blocks began to result in less clearly printed images.

Japanese woodblock printing was not used only for



artwork. Even into the 20th century the text as well as the pictures of illustrated books were routinely woodblock-printed. As technology progressed, metal type, lithography, photography, and photomechanical

processes came into use. Though publishers adopted all these innovations, they continued to commission the carving of woodblocks for newspaper supplements and other kinds of illustrations, including single-sheet prints of traditional subjects such as actors, warriors, and kimono-clad courtesans.

Faced in 1894 with the challenge of arousing public enthusiasm for the war with China, print publishers re-

verted immediately from lithography to the older woodblock technology. Woodcuts were more familiar to the buying public, and in fact images could be printed more clearly with the traditional technology. The appeal of multicolour woodblock prints proved to be immense, with the most popular battle scenes reportedly selling more than 100,000 copies of each design. The vast majority of the war prints were designed as triptychs comprising compositionally linked, vertical standard-sized sheets, which provided a picture plane of approximately 37 by 75 centimetres.

All but a few of the prints depict Japanese "glory" on the battlefield. Korea had a history of turbulent relations with Japan. Still, the two countries had also enjoyed long periods without hostilities. For several millennia Korean culture periodically transmitted to Japan intellectual and technological advances, including many of Chinese origin.

Two devastating Japanese invasions of Korea in the late 16th century brought Korean-Japanese relations to an unprecedented low point. Japan's war guilt was admitted in a conciliatory treaty by the following regime. The first Tokugawa shogun successfully revived friendly relations between the two nations from 1609 until 1764, although the Koreans placed severe restrictions on the Japanese embassies in contrast to the large Korean missions permitted in Japan.

Following the Meiji Imperial Restoration of 1868, another Japanese government attempted to re-establish formal treaty relationships with Korea, only to be rebuffed. Japan responded in 1875 with gunboat diplomacy, a tactic prevalent worldwide in the 19th century, and in the following year succeeded in opening the "hermit kingdom" Korea to international trade and diplomacy—an endeavour in which the European powers had so far failed.

Japanese intellectuals, in the throes of the Meiji "enlightenment and civilization" movement, seemed to believe sincerely that opening Korea forcibly to international relations was a progressive course of action, and would ultimately aid the Korean people. They held these beliefs despite Japan's own humbling experience with European and American treaties two decades earlier.

China, on the other hand, knew only too well the dangers of territorial encroachment by imperialist powers and sought to maintain Korea as its most important tributary and buffer state. Feeling increasingly threatened by the Meiji government's interest in Korea, China allowed the encroachment of Western diplomats and traders in order to balance Japanese inroads. Korea thus succumbed to the often exploitative treaty-port system prevalent throughout late 19th-century Asia.

During this time in Korea, the polarization of diverse attitudes towards modernization produced two main groups: one was led by conservative Neo-Confucian scholars who saw Japan and the West as equally bar-

barous, and the other by pro-Japanese reformers. Korea's international reputation for conservatism was belied by some very active progressive elements in that country. In 1884 one of the radical reformers, Kim Ok-kyun (1851-94), helped organize a political coup d'état with the full complicity of Japanese government officials in Seoul. The resident Chinese garrison foiled the attempted coup, but soon afterwards 40 Japanese were killed and the Japanese legation in Seoul was burned, for the second time in three years, by angry Korean crowds. Kim Ok-kyun and eight other Korean leaders of the coup sought political asylum in Japan. Events of the next years would lead to the 1894 Sino-Japanese conflict.

The Far Eastern Department of the Royal Ontario Museum, in the past decade, has received gifts of two groups of prints illustrating the battles and events surrounding the Sino-Japanese conflict of 100 years ago. They complement a few previously acquired prints of the Russo-Japanese War of 1904-05.

Although Kim was initially welcomed by the Japanese, during his exile interest in his movement began to wane. In 1894 a small band of well-subsidized Koreans was dispatched to Japan to gain the exiles' confidence and to kill them. Several of the conspirators accompanied Kim to Shanghai where they claimed money was waiting to finance a second coup in Korea. On 28 March, while he was resting in his room in the upper storey of a Japanese inn located in Shanghai's International Settlement, one of Kim's new friends assassinated him.

A print designed by artist Kokunimasa (active 1874-1912) vividly portrays the assassination. Kim, in Western dress, arises from his futon just after his assassin, attired in somewhat fanciful traditional Korean garb, has fired the first shot. After Kim's murder his former friends in Japan regained their fervour for his movement, and Kim was portrayed as a martyred hero of Korean independence. The Japanese public quickly became incensed that a political refugee had been lured from their country to his death. Demagogues tried to link the event to the Chinese Resident in Seoul and demanded punitive action. Japanese outrage increased after Kim's body was returned to Korea for official mutilation to warn other potential "traitors."

Kim's assassination in Shanghai was followed several months later by an event in Korea that also helped to precipitate the war. A May uprising by the Tonghak ("Eastern Learning Society") peasant army demanded an end to corrupt governmental practices and to the granting of concessions to foreigners. The rebellion prompted Korea to request increased Chinese troop deployment and a force of 1500 arrived in early June.

Japan dispatched twice that number of troops to Seoul with returning Japanese Minister Ōtori Keisuke (1832-1911) on the pretext of protecting Japanese res-

idents from the rebels. In reality the soldiers were sent to counteract the escalating Chinese presence. The insurgents were temporarily dispersed after the Korean government agreed to consider their demands, and China asked Japan to evacuate its forces. Tokyo responded by deploying even more troops.

Minister Ōtori took advantage of the explosive situation to force King Kojong (reigned 1863-1907) to abro-



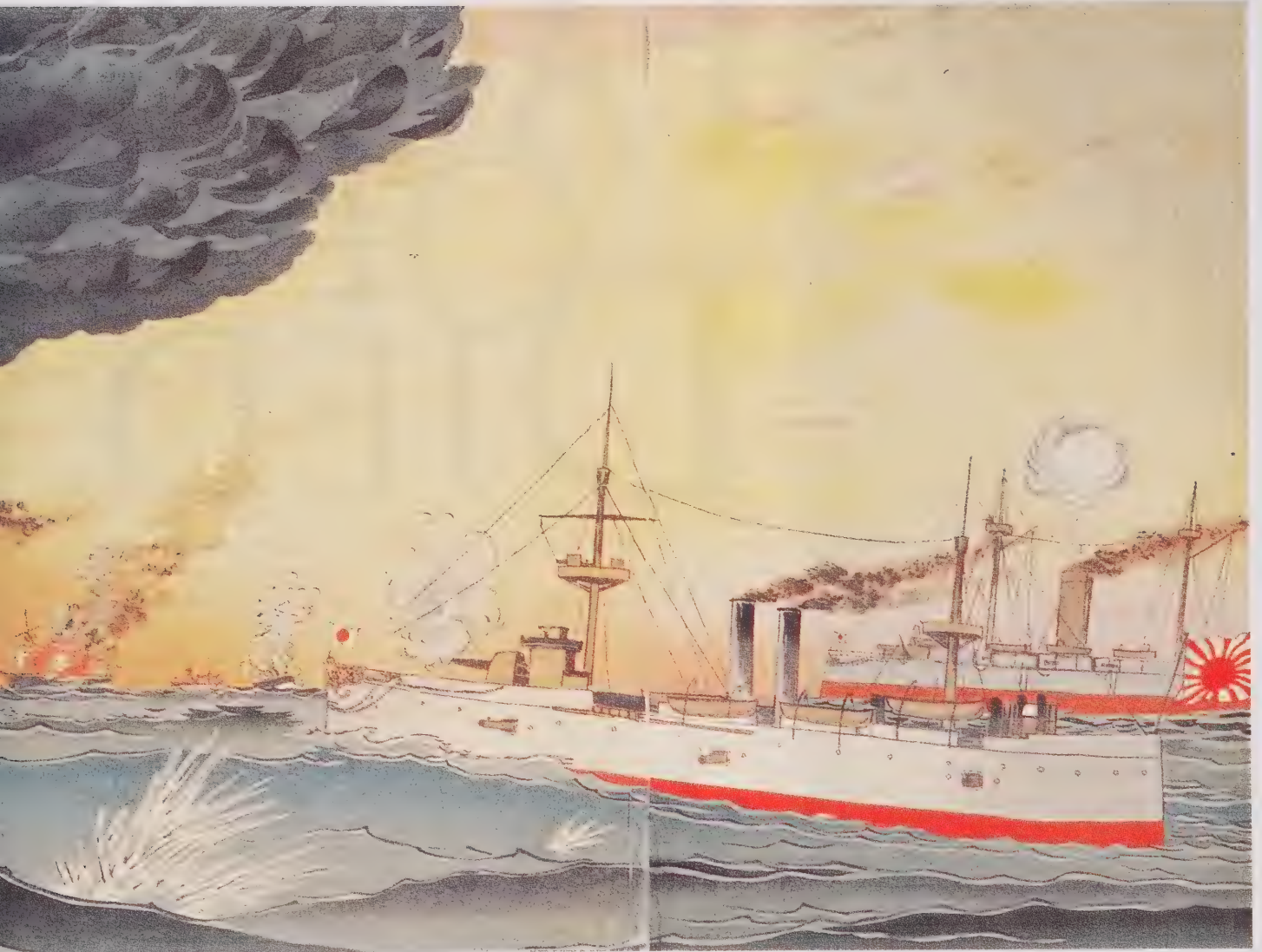
Picture of the great victory at the great sea battle offshore Haiyang Island at twilight (Meiji period, dated October 1894) by Kobayashi Kiyochika (1847-1915). The Battle of the Yellow Sea took place during the afternoon of 17 September 1894. It is depicted in this woodblock-print triptych. Gift of Jane Dobell.

gate all treaties with China. On 23 July 1894 Japanese troops clashed with Korean palace guards in a pre-dawn raid and took control of the king's palace. A print pictures Ōtori riding in a horse-drawn carriage. He is in the company of the king's father, who is in Korean dress and travelling on horseback. As former Regent—the Taewŏn'gun (Yi Ha-ung, 1821-98)—the king's father

had wielded immense power; he is shown, accompanied by the troops, arriving at the palace to take charge once more of the government. The Japanese would rely on him to pressure the king into instituting reforms and supporting Japan. Historical records state that the two visitors arrived at about 11:00 a.m., although not together; Kokunimasa's print, published in August, shortly after the incident, telescoped three separate occurrences

per left corner of the composition.

Failing light, rather than the clear superiority of either side, helped to bring this afternoon and early evening battle to a close. Kiyochika had incorporated various effects of light into his print designs from the time he first encountered Western painting methods in the mid 1870s. He was one of the most accomplished artists composing battle prints and also possibly the most




of that day into one composition.

The 17 September 1894 Battle of the Yellow Sea, pictured in a third print, was the world's first battle fought entirely with steam-powered vessels. The image is completely accurate, though like the other two

from the ROM's collection, the print was not based on direct observations by the artist. It was published in the month following the victory of Japanese warships over the larger Chinese northern squadron. The title of this design by Kobayashi Kiyochika (1847-1915), *Picture of the great victory at the great sea battle off-shore Haiyang Island at twilight*, was printed in the up-

per left corner of the composition.

productive, contributing more than 70 triptych designs. Meiji-period intellectuals and the Japanese public felt the Sino-Japanese War was fought for the sake of world civilization, to defeat reactionary regimes which, unlike Japan, were still unenlightened. From the time of the 1868 Imperial Restoration, Japan had tried vigorously to prove the permanence of its recent efforts at modernization. In that age of imperialism, if not today, world leaders viewed the ability to wage a foreign war for territorial gain as proof that a country was fully civilized. The war depicted in these prints also was felt by Japan to be a first, essential bid for leadership in the struggle against Western encroachment in Asia. ♡



THE FACES OF DJED

*A CT-scan of a ROM mummy
illuminates a life from ancient Egypt*

LEE-ANNE JACK

AMID IMAGES OF PYRAMIDS GLOWING AGAINST the luminous desert sky and gold treasures reflecting the mysteries of a land of winged gods and mighty Pharaohs, it's difficult to imagine that in ancient Egypt there also lived men and women who went about ordinary daily tasks, who lived, loved, and suffered.

Some three millennia ago, in the middle of the 9th century BC in Thebes, just such a middle-class young woman named Djedmaatesankh lived with her husband Paankhntof on the east bank of the river Nile. They were well-off, pious, and respectable, although as a double-income couple

*Lee-Anne Jack is a writer and editor in the Publications
Department, Royal Ontario Museum*

without children in ancient Egypt they would have been somewhat unusual. Djedmaatesankh was a musician at the great Temple of Amun-Re at nearby Karnak where her husband was a temple doorkeeper. These mildly prestigious roles may have provided the couple with some comfort as part of the deity's household as well as small wages to supplement their main income from a parcel of fertile Nile land on which they may have grown crops of barley, sesame, or dates.

Although Thebes had become the seat of power for all Egypt by the 22nd Dynasty, political times were turbulent, and Djedmaatesankh may have worried about the Libyan mercenaries who had overthrown Egypt's royalty and were now ruling as kings. She may have grieved for her inability to bear children. And certainly, as she approached her thirties, she must have worried for her health.

Seen now, 2800 years later, behind a glass display in the Royal Ontario Museum, where she arrived at the beginning of this century in her fragile mummy case, Djedmaatesankh seems distant, to be appreciated more as a work of art than as a woman whose fortunes were once determined by the same natural laws as our own. The symbols and stories painted on her linen-and-glue cartonnage in still startlingly vivid oranges, reds, and golds tell only part of her tale. But researchers were loath to tamper with the beautiful case, one of the best preserved of its period, to find out more about her.

The diminutive mummy kept the secrets of her life and death wrapped up with her—until last year. That's when modern medicine stepped in to provide the technology to remove electronically her bandages, to peek inside the cartonnage without cutting it open, and to research her remains while preserving the sanctity of the human body, a concept the Egyptians held dear.

Under the direction of ROM curator Dr. Nicholas B. Millet and Dr. Peter Lewin, a paediatrician at the Hospital for Sick Children and researcher of ancient disease, Djedmaatesankh underwent a full-body CT-scan (computerized axial tomography) while still inside her protective case. Lewin's colleague, medical radiation technologist Stephanie Holowka, and imaging specialist Mike Starr took the resulting cross-sectional x-rays and reconstructed them into three-dimensional computer images. Against the odds, the pictures revealed the probable cause of Djedmaatesankh's death—a horrendous 2.54-cm chronically infected dental cyst in her upper left jaw that had probably burst and poisoned her. The images also showed that, unlike the grim-looking royal mummy of Ramesses III—whose face has been used as the model for villains in many modern horror films—Djed was strikingly handsome.

Looking upon a face from so long ago, a face not unlike that of any other young woman in Egypt today, binds us more personally to history. The satisfaction of being able to put a face to a name has, in a way her Theban relatives probably never could have imagined, given Djedmaatesankh a radiant afterlife. It has landed her dozens of appearances in newspapers and magazines in Canada and abroad and even a cameo part in a recent television commercial.

For the researchers from various disciplines who worked to bring Djedmaatesankh's image to light and helped to write another chapter of her life story, she has become much more than an object in a museum. In some ways, the researchers were touched personally by the experience of turning their skills, normally applied to the pursuits of the modern world, to finding out more about the musician lady of Thebes. Through their intersecting stories, the tale of Djed unfolds.

• • •

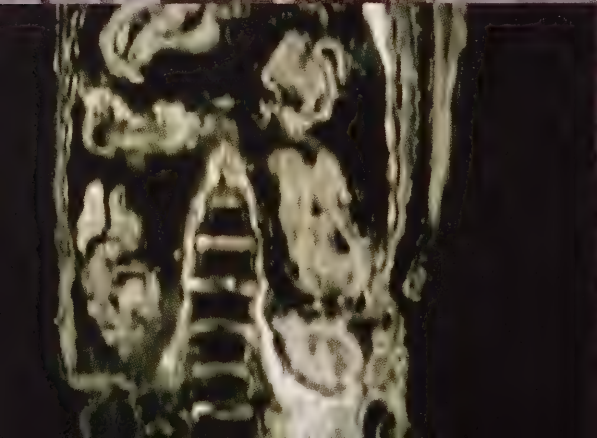
Since his retirement three years ago, dental scientist Tony Melcher has been researching the history of dental disease. When he read in the newspaper about Djedmaatesankh's dental cyst, he was quick to take time out

The mummified remains of a young Egyptian woman named Djedmaatesankh, encased in an exquisitely painted linen cartonnage (facing page), is displayed in the Ancient Egypt Gallery of the ROM. Archaeologist Nicholas B. Millet (below) has studied Egypt for more than 40 years, 25 of them while on staff at the ROM.





Facing page: The mummy can be seen in the scanner gantry, on the television monitor on top of the scanner's console. A computer screen on the console shows an original CT-scan of the mummy with a reformatted image showing the linen packing in the brain cavity. This page: The mummy lies outside the scanner gantry (above); Stephanie Holowka and Dr. Peter Lewin of the Hospital for Sick Children look at original scans and reformatted images of the mummy (below); a reformatted image of the mummy's chest and abdominal cavities reveals packs containing her organs (bottom).



from studying the diaries and papers of such well-known dental sufferers as William Wordsworth, Samuel Taylor Coleridge, and George Washington to step further back in history. Melcher approached Dr. Lewin, who arranged for him to meet with Stephanie Holowka, the technologist at the Hospital for Sick Children who had prepared the computer reconstruction of Djedmaatesankh. Holowka went back to her keyboard to do a more detailed reconstruction of Djed's mouth, tooth by tooth. On the screen, an agonizing image soon emerged. Aside from the enormous wound—which has commonly been referred to as an abscess but is more properly termed a cyst—there was evidence of 13 smaller abscesses and extensive dental disease. One of Djed's canines was impacted and three other teeth were missing, possibly from the gum disease evident throughout her mouth. "I became more and more horrified, the more closely I looked," says Melcher.

He noticed that the outer enamel coverings on her teeth had been destroyed, mainly by wear but to a lesser extent by caries also. Worn teeth were a problem common among ancient peoples. With only rudimentary cooking implements available to prepare it, their food was very coarse. In Egypt, their daily bread had a high sand content which ground down teeth as it was chewed. Cavities appear to have been widespread in Egypt where, at least among the wealthy, honey and other sweet foods and beers were staples of the diet.

According to Melcher, once tooth enamel is worn away and the sensitive dentine beneath is exposed, anything sweet, hot, or cold could cause discomfort. In Djedmaatesankh's case, the damage is so extensive that the dental pulp—commonly called the root—is exposed on 24 of her 28 teeth. "Once the pulp is exposed," says Melcher, "that is a sharp, acute pain, a most awful pain. Anything, even breathing in cold air, would hurt. Trying to eat would hurt enormously. Then the tooth would hurt of its own accord; it would ache."

Exposed dental pulp quickly becomes infected, and the spread of this infection through the root canal to the bone probably caused Djedmaatesankh's many abscesses and the pus-filled cyst. The cyst measures 5 ml in volume—the equivalent of a teaspoon—and involves five of the eight teeth in her upper left jaw.

Of five drainage holes that appear in her jawbone near the large cyst, one was at first thought to have resulted from an early attempt at dentistry. There are two examples in the literature of holes in ancient Egyptian jaws that are believed to have been drilled to drain dental abscesses. Physician-dentists, identified in hieroglyphics by a tusk symbol, had existed in ancient Egypt since about 2800 BC. The Edwin Smith surgical papyrus, believed to have been written in 2500 BC, more than 1500 years before Djedmaatesankh's time, indicates that Egyptian physicians did know how to use fire-drills for medical purposes. A case cited in the papyrus describes how an abscess was drained in the patient's chest.

But Melcher says closer examination of the 3-D reconstructions show the hole in Djedmaatesankh's jaw to be too asymmetrical to have been drilled, and it occurs where the bone is very thin. Melcher believes escaping pus from the abscess forced its way through the bone. The five holes were positioned in such a way that pus would have been draining into Djed's mouth, into the skin of her cheek, and through her nose. "She must have had a foul taste in her mouth and she would have had a swollen face," says Melcher. "On one side her face would have been deformed." The force of the cyst had also deformed the palate in the roof of her mouth, thereby affecting her speech. "So she perhaps would have had some enormous social problems," he speculates.

Melcher estimates that Djedmaatesankh's dental problems may have started when she was as young as 10 or 12 years old. Stephanie Holowka notes the incredulity about the cause of Djed's death inspired in 20th-

century flossers and brushers. "People say to me 'A dental abscess? She died of a dental abscess?'" Yet at the time, death from dental disease would probably not have been uncommon, judging by the snagged smiles worn by many Egyptian mummies.

Today, a course of antibiotics would have put a quick stop to Djedmaatesankh's misery. But without the benefit of tooth extraction, her only recourse may have lain in the many recipes for the treatment of sore gums and teeth. It's not known, says Melcher, whether Egyptians had learned from their Assyrian neighbours to use cloves as a treatment for toothache. But, for her extreme pain, Djed almost certainly would have had access to opium.

...

Stephanie Holowka, a medical radiation technologist at the Hospital for Sick Children, has volunteered close to 100 work hours to CT-scan and reconstruct three-dimensional images of Djedmaatesankh. Working on diagnostic and surgical applications of 3-D imaging during the day, Holowka says reconstructing the Egyptian mummy on evenings and weekends was a labour of love.

"I think there are always things to learn from looking at ancient people," she says. "Certain diseases like rheumatoid arthritis you don't see past a certain time in humans, which tells us it's a relatively recent disease. And there's that fascination where you think this person lived 2800 years ago, walked, breathed on this Earth 2800 years ago and I'm looking at her now."

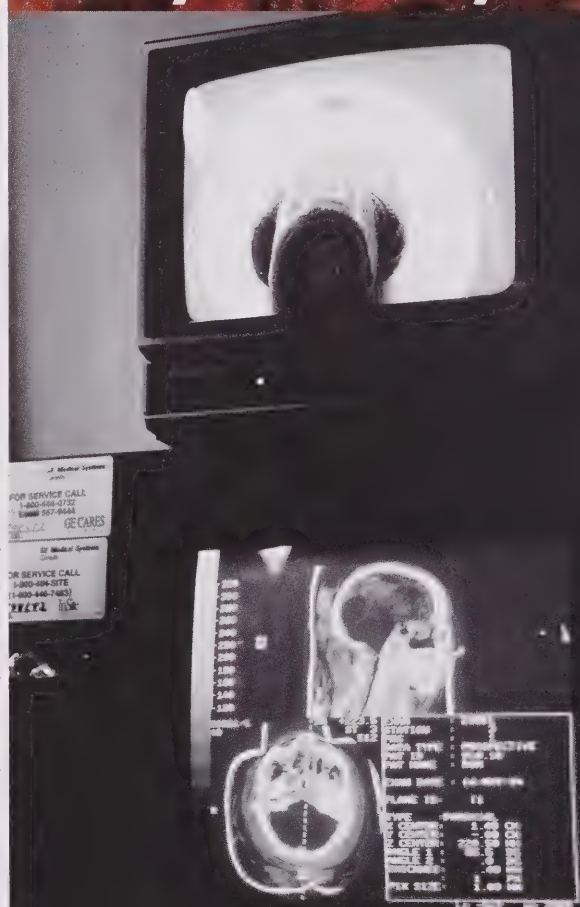
Dr. Lewin was one of the doctors who pioneered the use of CT-scans on mummies in the early 1970s and he oversaw a previous scan of Djedmaatesankh in 1978. Carried out in the early days of CT technology, the scan revealed that Djed was wearing pieces of funerary jewellery and that the state of preservation of her body was excellent. But with the development of more advanced equipment, and the ability to do 3-D reconstructions, last year Lewin asked for Holowka's help to perform a re-scan.

Holowka spent four hours on a Saturday in May scanning Djedmaatesankh, using the equipment while it was scheduled for recalibration, in order not to bump patients on the waiting list. She produced 300 cross-sectional x-ray "slices." "We didn't have to worry about dosage," says Holowka, "because Djedmaatesankh is already dead, whereas when working with kids we are very concerned about what dosage to give for x-rays." That allowed her to take slices of 5 mm thickness on the torso and reduce her slice thickness from 5 mm, used in the earlier scan, down to 3 mm through the head, slicing as fine as 1.5 mm through the ears and eyes.

Loaded onto an ISG Allegro workstation, the 2-D scan images are stacked one on the other electronically to produce a volume—a rough 3-D image. By deciding which density values to include in a particular picture, Holowka was able to remove layers of cartonnage and linen wrappings, to expose Djed's burial amulets, her flesh and bone, and the canopic organ packets replaced inside her body after embalming.

Because Djed's bones have become very demineralized and lower than normal in density, and her soft tissues have hardened with age and resins, the density values began to converge, making it difficult to distinguish between them. Reconstructing Djedmaatesankh's skull took Holowka three hours rather than the 10 minutes it would take for a live patient. She hand-edited slice by slice to separate resins, linen bandages, and other packing material from Djedmaatesankh's skin surface. Compression from the bandages gave her skin a lumpy appearance. Mike Starr, an imaging specialist at the hospital, took Holowka's final images, added eyes, and made other cosmetic changes, smoothing the skin, for example, and projecting to average proportions the nose and mouth, which had been misshapen by the bandages.

The secrets of the diminutive mummy were wrapped up with her until modern medicine provided the technology to remove electronically her bandages, to peek inside the cartonnage without cutting it open, and to research the remains while preserving the sanctity of the body



Lewin has been contacted by archaeologists, religious groups that prohibit conventional autopsy, and police forensic units, all interested in how he has applied medical technology to reconstruct detailed images of bodies without damaging them



From the CT-images alone, Djed's large dental cyst was evident. "You look at that abscess," says Holowka, "and it is severe enough to cause sepsis and death." But some things will remain unknown. "If she had had a brain tumour, we wouldn't have known because they took the brain out."

Based on the wear evident in the clear images of her teeth, Djedmaatesankh's age at death is estimated at 35 years. The pictures also revealed that fragile tissue structures such as a cavernous sinus, and blood vessels still within their foramina, remained intact. Even the falx cerebri, one of the meninges that extend between the two hemispheres of the brain, was intact.

Although the main advantage of performing an autopsy electronically was the preservation of Djed's cartonnage and body, Holowka says that in some respects the scan revealed more information than an autopsy would have. "Nobody would want to take apart a face to find an abscess like that," she says. "You look in the abdomen, you look in the skull cavity. But there's no way you'd get the information you got off the CT."

...

On Dr. Peter Lewin's office wall hangs a framed photograph of a mummified head flanked by an exchange of letters between Lewin and the Right Honourable Pierre Elliott Trudeau remarking on the uncanny resemblance of the Egyptian's head to the former prime minister's. Thirty years of studying the diseases of ancient man hasn't dampened Lewin's sense of humour or his enthusiasm for discovery.

Lewin grew up in Alexandria, Egypt, and his interest in ancient humanity was sparked when a boyhood search to uncover treasures like those of Tutankhamun turned up riches of old bones instead. As a doctor in Canada, Lewin began applying his knowledge to the research of ancient disease. Today he is considered a leader in palaeopathology, a multidisciplinary field of study in which teams including practitioners as diverse as physicians, historians, archaeologists, pathologists, radiologists, and researchers in molecular sciences study ancient remains in order to piece together a historical picture of human health and disease.

Spearheading the recent CT-scan of Djedmaatesankh, Lewin drove the project forward with zeal. In his quest for new data, Lewin was soon rewarded, as almost immediately the huge dental cyst in Djedmaatesankh's jaw became evident. "That probably was the major cause of her death," says Lewin. Pus from the abscess may have spread to her blood, brain, or heart and caused blood poisoning or meningitis.

Pelvic examination showed Djed's pubic bone to be intact, denoting that she had never had children. This would have been unusual for a married woman of her age. "So she perhaps was infertile," concludes Lewin. "When a woman has a baby, the pubic bones separate to let the baby through and then heal again. This causes scarring and you can get an idea of how many children she's had. Djed had no separation."

By studying the state of health and disease in ancient people, says Lewin, researchers can compare their findings to present-day health and see the adaptation of humanity to the environment. Behind this quest lies the hope that some diseases will eventually be traced well enough to show clearly how they have changed over time, bringing researchers that much closer to cures.

Lewin's studies of ancient pathology began in 1966 as a pathologist at the Banting Institute. Winifred Needler, curator of the ROM's Egyptian Department at the time, knowing of Lewin's interest in Egyptology, had sent him the mummified hand of an Egyptian girl. When he examined it under an electron microscope, he was astonished to find tissues with intact cells at the organelle level.

"At the time," says Lewin, "a lot of people were interested because it meant the ancient proteins and the genetic material were intact." Lewin tried to extract DNA but was unsuccessful. But biology professor Dr.

George O. Poinar, Jr., at the University of California at Berkeley, took up the task. Poinar is the world's expert on the preservation of insects and biological material in amber and was eventually successful in extracting DNA from insects millions of years old. "It's from his work that [novelist Michael] Crichton got the theme for *Jurassic Park*," says Lewin. "So in part I contributed."

Shortly after, Lewin began doing traditional autopsies on mummies. Although the results varied in their usefulness to science, the process was quite destructive. "We really didn't find anything dramatic," says Lewin of one autopsy in Detroit, "so we in essence destroyed that poor mummy for nothing." He was inspired to try new methods by Nakht, a mummy at the former Museum of Medicine in Toronto and now at the ROM. Because Nakht hadn't been mummified conventionally, all his organs, including the brain, were intact.

A traditional autopsy had already shown that the 14-year-old weaver suffered from cirrhosis of the liver caused by bilharzia, a disease still common in Egypt. It also revealed that Nakht had muscular cysts associated with pork tapeworm, a condition unlikely to appear in modern, Muslim-dominated Egypt. But Lewin wished to study the rare, ancient brain without destroying it. Around the same time, a new CT-scanner was being installed at the Hospital for Sick Children and, with Dr. Derek Harwood-Nash, Lewin obtained permission to try it out on Nakht. In today's research climate, which emphasizes the balance between conservation and study, the use of CT-scans is becoming indispensable.

With Djedmaatesankh, Lewin says, "Not only did we reconstruct what this beautiful lady looked like, we determined a major cause of her death, all the time leaving her intact." Since Djed's re-scan, Lewin has been contacted by archaeologists, religious groups that prohibit conventional autopsy, and police forensic units, all interested in how he has applied medical technology to reconstruct detailed images of bodies without damaging them.

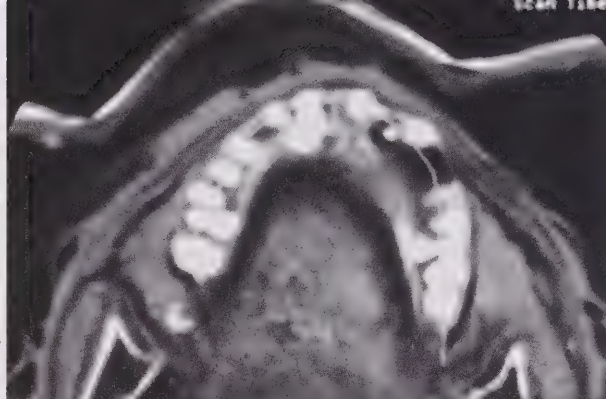
...

At Metropolitan Toronto Police headquarters, police artist Betté Clark shuffles through hairstyles of the mid-1940s to use in her composite sketch of a woman whose body was dug up last spring under the premises of Robertson Motors in Toronto. This is the latest of some 20 skulls on which Clark has done facial reconstructions. But working on one as ancient as Djedmaatesankh's was a new challenge.

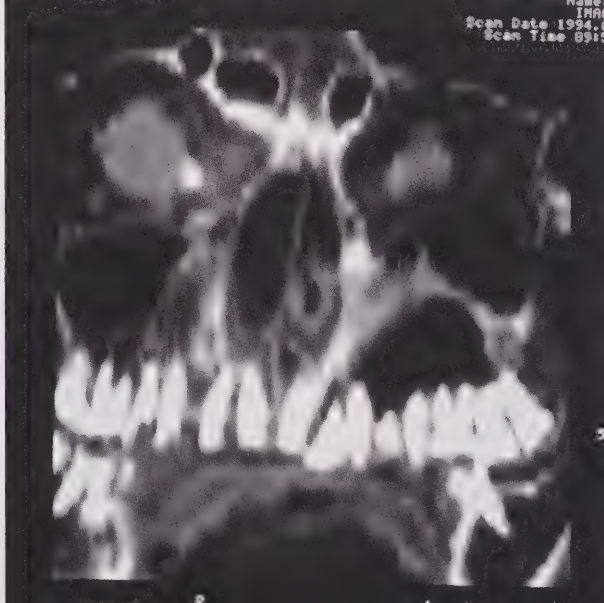
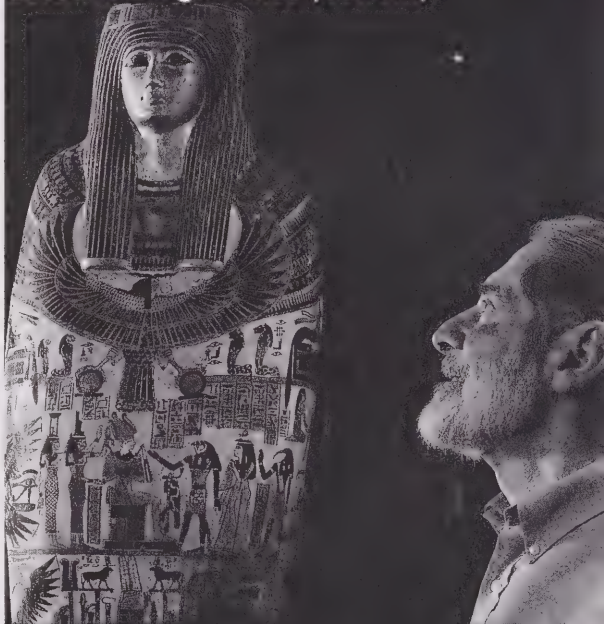
Clark was approached by the ROM's Egyptian Department curators after they had heard about police interest in Lewin's work. Curious to see how different techniques might produce various results, they asked Clark to put her forensics expertise to work to come up with a comparative portrait of Djed. Using a low-tech, pencil-and-paper approach to facial reconstruction, in contrast with the high-tech computerized methods used by Lewin's team, Clark ended up with a slight variation of Djedmaatesankh's features. "Coming up with a face from a skull is like giving a piece of wood a personality," says Clark. "[Djed] has been sitting in there centuries and nobody knew what she looked like. I just wish we could have somebody say 'Oh yeah, I remember her.'"

An artist by training, Clark sometimes receives as her source for facial reconstruction an actual skull, which she traces on paper; at other times she has only a photograph to work from. The CT-scan images of Djedmaatesankh's skull, sent to her by Stephanie Holowka for her rough sketching, were unusual but useful source materials. Because the 3-D images of Djed showed several angles—face tilted up, to the side, and full-face—Clark says it was easier to get to know her. And a certain amount of flesh still evident in the images gave her a jump start.

Following specific landmarks on the skull, Clark records the landscape



Facing page: One of the many colourful images from Djedmaatesankh's cartonnage. **This page:** An original CT-scan of the mummy's upper jaw and teeth (above). The black gap on the right is a cyst or abscess. Dr. Tony Melcher, a researcher of the history of dental disease, looks at one of his most intriguing subjects (below); a curved, reformatted image of Djed's upper jaw, showing a cyst below the right sinus (bottom).





Facing page: Betté Clark, police artist with the Metropolitan Toronto Police, created a portrait of Djedmaatesankh based on information supplied from the CT-scans. This page: An image from the cartonnage (above); Betté Clark looks at her drawing of Djed (below); Mike Starr, a computer-imaging expert, reconstructed Djed's face (bottom).



of the face. "I like to let the skull talk to me," she says. Where the attachments for eyes fall is one important key. The lower eye attachment makes a small notch in the skull near the nose and the upper attachment is placed at the eye's outer corner, which varies in position depending on race. Lower lids, on every face, flow smoothly from corner to corner, while upper lids can vary between heavy, fatty, or deep-set. Information from an examining anthropologist on the skull's sex, race, and age usually gives Clark clues to work with. Such information was already known in Djedmaatesankh's case.

Layer by layer Clark built up Djedmaatesankh's face, drawing in the facial muscles and flesh before beginning work on the features themselves. "As far as I'm concerned, the nose makes the face," says Clark. It's also the most difficult feature to capture accurately. The shape of the bridge is determined by the skull, and a small bone attaching nose to skull shows the length, but the shape of the fleshy part in between is based on educated guesswork. Very little research has been done on facial measurements. "When I first started doing this," says Clark, "I had people sticking their fingers in their noses to see how far the cartilage extends below the nasal passage."

Clark was convinced Djed's nose was broken and that that was why she had such trouble reconstructing it. "I later found out that the brain was extracted through the nasal passage and that cracks it," she says. "There are very fine bones around that area." The accuracy of her drawings typically runs at 90 per cent, judging by bodies that have been positively identified based on her sketches. The drawing of Djed, however, drops another 10 per cent in accuracy because of the broken nasal bones.

Until the early 1980s, Clark had been a portrait painter. When her husband, who was then in charge of the Metropolitan Toronto Police Youth Bureau, began bringing home pictures of children who had been missing for several years, Clark volunteered her services to age their faces to give them the appearance they would have in the present day. She was so successful, with two of the first seven children she sketched being recovered, that she was hired permanently.

Had it been necessary for Clark to prepare a computer sketch with more photographic likeness for media distribution, she would have gone on to the second stage of the reconstruction process. Taking her final sketch, she would have matched each line of Djed's face feature for feature from the 200,000 faces in the police mug-shot file. Parts of those images would have been scanned into the computer and cut-and-pasted together to produce a final picture.

Working intimately with so many faces over the years, Clark likes to believe she has gained some insight into their characters. "She is so beautiful," Clark says of Djed, "and you know how much pain she was in. You've got to really feel sorry for her. But she's got a very kind face . . . such a strong face."

...

Nicholas B. Millet of the ROM's Egyptian Department has been studying Egyptian antiquity for 40 years. A feeling of common humanity ties him to these ancient people as his research traces the problems of their daily lives and their varied abilities to solve them. For him, the new data from Djed's CT-scan reinforces that feeling. "Finding a cause of death occurring for certain medical reasons at a certain time of life gives us a clearer picture of what it was like to live and die in ancient Egypt," he says. The 3-D images that put a face to the name on Djedmaatesankh's cartonnage will allow Millet to share with Museum visitors that same feeling of being linked to history.

The images provided a more exact age at death for Djedmaatesankh, which was underestimated by 10 to 15 years when the first x-rays were done. And more precise images were provided of Djed's funerary jewellery, which consists of a gold, vulture-shaped amulet and a stone heart

scarab, probably inscribed with a chapter from the *Book of the Dead* as a prayer to her own heart.

It's clear Djedmaatesankh was from Thebes, and was probably buried on the west bank of the Nile across from the Valley of the Kings, although exactly where she was found and when she arrived at the ROM remains uncertain. Her mummy case depicts the two cults pertaining to death that were adhered to, often simultaneously, in the 9th century BC: that of Osiris, the king of the dead; and that of the Sun god Re, god of the underworld. The sad poetry of Djedmaatesankh's name—which means “The goddess Maet has said that she will live”—is accompanied, as was usual, by the name of her mother, Shedtaope. But her husband's name also appears on the cartonnage, an unusual practice likely indicating that he had paid, at least in part, for the mummification and burial, an expense that may have set him back a year's income.

According to Millet, Djed and her husband's priestly titles at the Temple of Karnak were probably purchased, as was then the custom. “I imagine that they simply handed over some of their land to the temple in exchange for these titles and a share of the income, kind of like buying an annuity,” he says. “The nice part was you got a fancy title and you got to play music at the temple for some of the festivals.”

From an examination of the decoration themes and techniques, the names, and the costumes on Djed's cartonnage, and the techniques of mummification and burial, Millet estimates that she died sometime between 945 and 720 BC—probably in the middle of the range, some 500 years after King Tut's death. By Djed's day, mummification was no longer limited to royalty. The practice had become widespread among wealthy middle-class families and mummification skills had reached their peak. They declined in later dynasties as resins were applied more lavishly, imparting a blackened tar-like appearance that gave rise to the word “mummy,” which derives from the Persian word meaning “bitumen.”

To Egyptians, physical existence was sacred. It was important to them to preserve the bodies of their dead and to continue providing food for the part of the soul called the Ka that continued to inhabit the body. The Ba, another part of the Egyptian soul, went to paradise. It's not known exactly what gave rise to the idea of mummification, although it is sometimes surmised that when Egyptians saw the natural drying of bodies that occurred in early pre-mummification sand graves, they tried to improve on the process.

Egyptians recorded much information about their lives and beliefs, but very little was put on papyrus about mummification. The process, which took approximately 70 days, was itself somewhat destructive, and Millet says it carried a tinge of sacrilege. The person who made the incision in a body to remove the organs for embalming was ritualistically driven off.

“People today are astonished at the idea of the human body surviving 3000 years,” says Millet. Unfortunately, a perception goes with it that the elaborate ritual was carried out because Egyptians were obsessed by death. “In fact, it's just the opposite. They enjoyed life and wanted it to go on just the way it was. Their idea of heaven or paradise was very much along the lines of Egypt.”

• • •

The story of Djedmaatesankh tells as much about the researchers and how they were affected by their work on her as it does about the mummy herself. Seeing a face that has been shrouded for almost three millennia, that witnessed one of the first civilizations on Earth, is awe-inspiring.

Perhaps the next time you walk by Djedmaatesankh's case at the ROM, you'll pause to think of her not simply as a beautiful object of art, but as a beautiful woman of times past whose joys and sorrows carried her along the same journey of days walked by us all and to realize how much and how little life has changed. ♡

The work of researchers makes it possible to think of Djedmaatesankh not simply as an object in a museum display but rather as a woman of times past whose joys and sorrows carried her along the same journey of days walked by us all





Is there an acceptable substitute for polishing? A silver tray remains tarnished on the lower left. The upper part of the tray was unevenly cleaned by placing it on a metal plate in a solution of water and Calgon. An application of silver foam and polishing left the tray clean on the lower right.

Is There a Short-Cut for Cleaning Silver?

THE CLEANING OF SILVER IS AN ONEROUS and repetitive chore. However, for those lucky enough to own silver objects, the warm sheen of clean silver is well worth the effort. The most common telephone enquiry to the metals laboratory of the Conservation Department at the Royal Ontario Museum is, "How should I clean my silver?" Another common question is, "Do metal-plate cleaners work?"

Cleaning silver involves the removal of a thin and usually uneven layer of tarnish (silver sulfide) caused by hydrogen sulfide in the atmosphere. Current research has shown that humidity may play a role in the rate of tarnishing.

In the laboratory, a wide variety of cleaning techniques are available but many of these are not suitable

for home use because they require hazardous chemicals or special equipment. Often, these techniques are suitable only for spot cleaning.

Cleaning through the use of a metal plate immersed in an electrolyte depends upon electrochemical reduction. An aluminum plate is placed in a solution (electrolyte) of water and Calgon (sodium hexametaphosphate) or baking soda (sodium bicarbonate) or washing soda (sodium carbonate). A tarnished piece of silver placed on the aluminum plate is supposedly cleaned when corrosion of the plate produces hydrogen that reduces the silver sulfide on the object.

For several reasons, this technique is rarely used in the lab for bright metal. First, there is no control over the cleaning process when

objects are simply immersed in a cleaning solution. Some areas may need a little cleaning while others may require special attention or more vigorous cleaning. The result is an unevenly or possibly over-cleaned object. Furthermore, most silver with decorative detail looks better with a small amount of black left in the detail for contrast. In fact, black detailing can be part of the craftsman's finish, as is the case with many pieces by Georg Jensen. Indiscriminate cleaning can remove this very attractive effect.

In the search for an easy, efficient, and safe way to clean silver that I could recommend for home use, I decided to test the "metal plate" method and my old stand-by, polishing with silver foam. Armed with a selection of my own terribly

tarnished silver, I began to experiment in the laboratory using first an aluminum plate and then aluminum foil in a solution of baking soda. Thirty millilitres of soda to one litre of tap water—variously cold, warm, and boiling—in a pyrex dish produced no reaction. There were some positive results when a silver object was immersed in the solution at a rolling boil; however, all action stopped when the liquid was subsequently poured into a pyrex dish. Two hours of dabbling and nothing was achieved.

Not to be deterred, I decided to continue using the plate, following directions precisely. Out of a test group of seven objects, only one was cleaned moderately well. The rest were very unevenly cleaned: mottled on the flat areas, and too clean, as expected, in the detail areas. The soft metallic look of silver was never achieved. I did not polish with a soft cloth as recommended because the object was not yet properly cleaned.

When I dipped two knife handles into the solution to touch the plate, the black tarnish was replaced in seconds with a matte grey film that made the handles look like pewter. I panicked. The grey film did rub off with a cloth, just as the instructions said it would; however, reimmersing the handles in the solution still did not bring up the desired look, and the detail, of course, was over-cleaned.

After several discouraging hours I brought out the silver foam. A light cleaning followed by a rinse with water and drying produced perfect results. I concluded that the metal-plate method of cleaning could be recommended as a possible alternative to silver dip, which may contain thiourea, a suspected carcinogen. It was neither a time-saver nor was it really less expensive. There is simply no practical substitute for proper storage—dry and airtight as possible—and a tried-and-true cleaner.

SUSAN STOCK

Susan Stock is a metal conservator at the Royal Ontario Museum

GET DIZZY AFTER DINNER



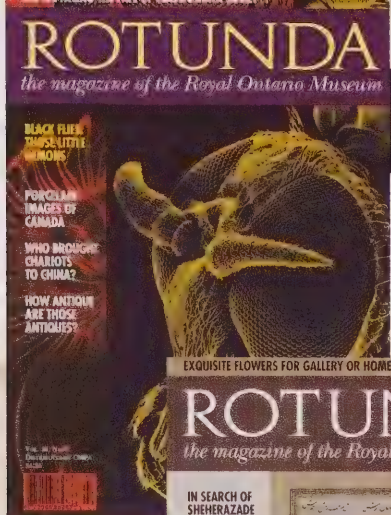
The Jazz Scene

Weeknights: 10 p.m.

Saturdays: 6 a.m.—Noon/7 p.m.—10 p.m.

Non-commercial Radio

91.1
CJRT-FM



A WONDERFUL GIFT FOR WONDERERS

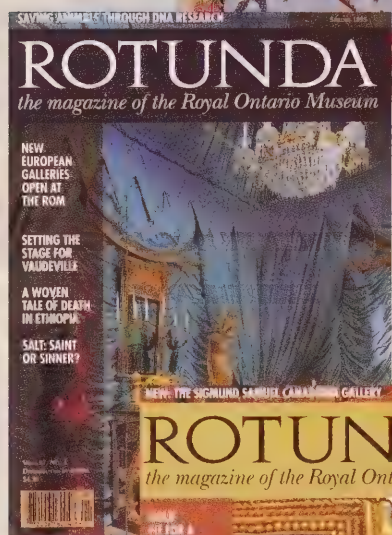
*fascinated by pharaohs? • enamoured with emeralds?
 awed by the orient? • passionate about porcelain?
 mesmerized by the Maya? • dazzled by dinosaurs?*

SEND THEM ON A JOURNEY OF DISCOVERY!

Rotunda takes your friends
 on a year-long expedition to this planet's most
 fascinating regions and cultures . . .

FOR AS LITTLE AS A LOONIE!

The holiday season is fast approaching, and we've made it easier than ever
 to give *Rotunda* to all your friends, especially those with a keen interest in
 natural and human history. It's essential. Compelling. Eye-opening.



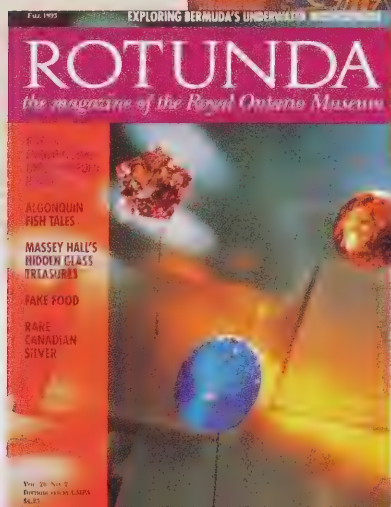
THIS YEAR, GIVE ROTUNDA!

Take advantage of Rotunda's special Holiday
 Gift offer: Your **third** gift is **only a dollar!**
 That's right: Introduce three of your friends
 to Rotunda this Christmas, and pay only \$1
 for the third subscription!

ROTUNDA. FOR WONDERERS

Just fill out the Holiday Gift card from this issue. We'll send you an attractive gift card for each
 gift, along with an acknowledgement confirming your order. Send no money now — we'll be happy
 to bill you later. Your first two gifts are \$16.95 each, and your third is just \$1 (GST extra).

Subscription Department, *Rotunda* magazine,
 35 Riviera Drive Unit 17, Markham, ON L3R 8N4





The church of St. Mary Magdalene (left) in Toronto is linked in many ways to the ROM. A massive wood cross (right), designed by William Rae and decorated by Franz Johnston and Frances Loring, is suspended below the chancel arch.

St. Mary Magdalene and the ROM

IN 1940 *SATURDAY NIGHT MAGAZINE* opined that visiting the Royal Ontario Museum's Chinese collection and attending the Anglican church of St. Mary Magdalene to hear its two choirs were the only things worth doing in Toronto. This was an appropriate juxtaposition because the histories of the two institutions are closely linked. The church and the original west wing of the ROM, erected in 1912, were the work of the same architect, Frank Darling, and details of their interiors were decorated by artists closely associated with the Museum.

Darling, one of Toronto's foremost architects in the late 19th and early 20th centuries, was the brother of the first rector of St. Mary Magdalene. St. Mary's was one of his few church commissions. Construction

of the church, located at the northeast corner of Ulster and Manning streets, began in 1888 and external detail was completed in 1908. Red brick, which had become fashionable in Toronto during the 1880s through the influence of the Arts and Crafts and Aesthetic movements, was used for the exterior.

Darling's designs for St. Mary's eschewed the pointed arches of the conventional Gothic Revival. The earliest part of the building shows the muted influences of the fashionable Richardsonian Romanesque style, seen at its most opulent in E. J. Lennox's City Hall (1889-99). Interior treatment of the timber roof and rounded chancel arch is superficially reminiscent of A. W. Blomfield's church of St. Barnabas, Oxford, while the generous and noble proportions combined with simplicity

and elegance are reminiscent of the medieval Italian churches of Umbria and Tuscany.

Similar handling of volumes and detail are found in the eclectic Italianate design and ornament of the ROM's west wing, although stock yellow brick rather than red was used in its construction. The large semi-circular arched windows in the facade looking onto Philosopher's Walk recall the monumental arched openings in the north and south sides of St. Mary Magdalene's chancel.

The interior decoration of St. Mary Magdalene was influenced by architect William Rae, who had worked on several Toronto churches. His involvement at St. Mary Magdalene began in 1921 and extended



Designed by William Rae, the Lady Altar is decorated with paintings by Sylvia Hahn, an artist associated for many years with the ROM.

for more than two decades. His most significant and lasting contribution was the design of the church's massive rood cross suspended below the chancel arch in the manner of the great European medieval crosses. Created as a World War I memorial, its polychrome decoration is by Franz Johnston, a member of the newly created Group of Seven painters, and a central Christus Rex in relief modelled by Frances Loring, the Toronto sculptor who would become well known for her work on the "lion" entrance to the Queen Elizabeth Way.

Rae designed stained glass and a new pulpit for St. Mary's as well. In the early 1940s, while also associated with the ROM, he supervised the construction of a Lady Altar with a painted triptych by the ROM's Sylvia Hahn, an outstanding display artist whose work for the Museum is still visible in its Greek and Roman galleries.

Hahn's paintings for the triptych

reveal her considerable knowledge of Italian Renaissance art and the ROM's European collections. To the left of the central panel of the Virgin and Child is a painting of St. Mary Magdalene holding a lidded box in her hand, and to the right is a painting of the Archangel Michael holding a sword. (The composition recalls a painting of St. Michael by Piero della Francesca in the National Gallery in London.) The box held by St. Mary is similar to a medieval Siculo-Arabic ivory original in the ROM's European collections. In turn, the sword held by St. Michael may have been inspired by a claymore in the Museum. Hahn knew the ROM's arms and armour collection well, and frequently lectured on its contents.

In addition to her work on the Lady Altar, which was dedicated in 1943, Sylvia Hahn provided the painted decoration for a Holy Child altar of 1944. It was an expression of

a contemporary fashion for "childrens' corners." The central motif of a youthful Jesus in white on a blue ground is a painterly evocation of Della Robbia terracotta reliefs of the Early Renaissance. It is surrounded by a sculptural frame of leaves, ribbons, and fruit in high relief similar to the border decoration on a tondo (c. 1480-1510), which the ROM acquired in 1920, attributed to the workshop of Andrea della Robbia.

There may be more places to see and more things to do in Toronto now than there were in 1940, but the rewards of visiting the ROM and the church of St. Mary Magdalene are as great as ever. Indeed, the degree to which their respective histories interlock suggests that a visit to one invites a reciprocal visit to the other.

K. COREY KEEBLE

Corey Keeble is an associate curator in the European Department, Royal Ontario Museum

❖ ROM ANSWERS ❖



Dear ROM Answers,

Enclosed with this letter are photographs of a chair that has been in my family for at least 60 years. My parents purchased it along with other furniture when they rented their first house in Toronto. The chair appears to be covered with a very dark brown paint, which has worn away from the front of the arms and the top front rung. The wood underneath has quite a lovely fine grain and light colour.

A label under the seat states: "North American Bent Chair Company, Limited/Owen Sound, Canada/Chair No. 4." I cannot determine whether there were one or two digits following the four because of a rather dark stain covering this area.

Can you tell me something about this furniture company? Is this chair of any historic value? Would removing the dark brown paint increase or lessen the chair's value? I have a large dining room table and a tall end-table with the same brown finish. Thank you for any information you may be able to provide.

H. S., SCARBOROUGH, ONTARIO

Dear Reader,

During the second half of the 19th century, a number of innovations took place in manufacturing. Among the most important was the increased use of steam engines and steam, both to run machinery and as part of industrial processes.

Your chair is an example of one of the processes in which steam was used to manufacture furniture. Beginning in the 1840s, wood was often bent with the help of steam to form component parts for chairs. Thonet in Vienna was one of the most important exponents of this process. Bentwood chairs from factories in Vienna were popular, primarily for restaurants and cafés, and were exported to North America.

The "Bent" in the company name on your label is probably a reference to the well-known chairs.

Your piece is one of a popular-priced variety known as a "press-back" chair. This name comes from the low-relief design on the back, which was created by placing the wood in a large press, which could have been operated by steam. The pattern was created by a steel die (i.e., mould) and was much cheaper to produce, especially in quantities, than carved decoration.

I have consulted Janet Holmes, a member of the curatorial staff in the Canadiana Department of the Royal Ontario Museum. She recalled seeing advertisements for the North American Bent Chair Company in trade directories and was able to locate listings for the company in the *Canadian Trade Index* for 1910-12 and 1920-21. You could probably consult a longer run of this periodical to find more precise dates for this company by going to the Business Section at the main Metropolitan Toronto Public Li-

If you possess furniture, silver, glass, metalwork, ceramics, textiles, or small decorative objects that may have an interesting past and have aroused your curiosity, this column is for you. Send a clear black-and-white photograph (or 35-mm colour slide) of the object against a simple background, providing dimensions, a description, any markings, or any known details of its history to: ROM Answers, c/o Rotunda Magazine, Royal Ontario Museum, 100 Queen's Park, Toronto, Ontario, M5S 2C6. Be

sure to enclose a stamped, self-addressed envelope large enough to include any photos that we must return to you with the reply.

Neither Rotunda nor the author nor any other person who may be consulted assumes any legal responsibility for these opinions or their ramifications. No financial appraisals will be offered. If your query is selected to be published in the column, only your initials and city will appear, in order to protect your privacy. Letters will be acknowledged as staff time comes available.

COME TO OUR HOUSE FOR THE HOLIDAYS!



EVENING GASLIGHT CHRISTMAS TOURS

The magic of a traditional Christmas – tour two of Toronto's most popular historic houses, illuminated by gas and candlelight. Christmas edibles and traditional beverages served.

SPADINA

Tuesdays, December 5, 12 & 19

MACKENZIE HOUSE

Thursdays, December 7, 14 & 21

\$10. (all ages) 7 or 8 p.m.

Reservations: (416) 392-6827 ext 265



GHOSTS OF CHRISTMAS PAST FAMILY FESTIVAL

Holiday fun with storytellers, Christmas Scavenger Hunt, mask and musical instrument making, children's Mummies' Parade, make-your-own sugar plums and more!

SPADINA

December 23 to January 7

\$5/\$4/\$3.50/Special family rate \$15.

Noon to 5 p.m. daily.

(closed Dec. 25, 26 and Jan. 1)

Information: (416) 392-6910

TORONTO HISTORICAL BOARD

Bring this ad and save **20%** OFF REGULAR ADMISSION

A great adventure retold

Paul Kane's Great Nor-West

DIANE EATON AND SHEILA URBANIK

Offering a unique panorama of the 'Great Nor-West,' this book tells the story of an adventurous journey 150 years ago and describes, in Kane's words and sketches, the lives and customs of the Native people. Among the many illustrations are the romanticized oil paintings done after the journey, which provide fascinating contrasts to the more immediate and accurate field drawings.

176 pp, 10 x 10", 26 col & 25 b/w illus, cloth \$39.95

In your bookstore or from UBC Press

Tel: 604/822-5959, fax 1-800-668-0821. Shipping \$5.00

6344 Memorial Road, Vancouver, BC V6T 1Z2



ROM ANSWERS CONTINUED

brary at 789 Yonge Street, Toronto. Other large reference libraries may also hold a complete set of the *Canadian Trade Index*.

Press-back chairs seem to have been in production from the 1890s through to as late as the 1920s. They could be purchased by mail order through publications such as *The T. Eaton Company Limited Catalogue*. The impressed designs came in a variety of patterns, including the most interesting that I have ever seen: small portraits of King Edward VII and Queen Alexandra, made to commemorate the coronation in 1902. Neither Janet Holmes nor I have ever seen a chair with its original paper label; this makes yours very special. It is possible that the brown finish may be the original and should be left on the piece because it adds greatly to its financial value as a documentary example.

On checking *The T. Eaton Company Limited, Fall and Winter Catalogue* (No. 47), 1901-1902, which was reprinted in 1970, I found an arm-chair with arms and turned supports that match those on your chair. It was priced at \$1.65 and a matching side chair cost \$1.00. The cheapest press-back chair was very affordable at a cost of only 40 cents.

Press-back chairs have been collected since the 1970s and sell for considerably more nowadays. (Please note that the ROM and its staff are not allowed to offer appraisals.) In fact, the market has expanded so much that reproductions are now being made.

The Canadiana Department displays press-back chairs in a late Victorian dining room setting in the new Samuel Canadiana Galleries at the ROM. Janet Holmes would very much appreciate receiving a photograph of your chair and of its paper label to keep in her files. Although similar chairs were once found in nearly every Ontario home, very few documentary examples like yours have survived. Thank you for your letter.

PETER KAEELGREN
EUROPEAN DEPARTMENT, ROM

Vegetarianism, the Leahey Family, Guides to Birds and Fishes, Folk Art, and more...

“IF VEGETARIANS EAT VEGETABLES,” the comedian Dave Broadfoot once asked, “then what do humanitarians eat?” The query is more serious than it sounds. Most of us probably believe that vegetarianism was a product of the 19th century, when it was mixed together, in a strange stew of social and political ideas, with other radical causes of the time, including women’s suffrage, Fabian socialism, utopian communities, Home Rule for Ireland, and decimal coinage for the Empire. Certainly most of the surprisingly few previous books on vegetarian history have tended to see the subject that way—as the story of Victorian dietary reformers, with perhaps a quick nod back at the eating habits of Leonardo da Vinci. That’s why Colin Spencer’s study **The Heretic’s Feast: A History of Vegetarianism** (University Press of New England, US\$27.95) is so refreshing. Spencer has read widely and deeply in religion, philosophy, agriculture, technology, and half a dozen other fields to produce this rich work. It chronicles not only the practice of vegetarianism by individuals but also the story of how, for certain periods and in certain cultures, the impulse grew into organized movements.

The term “vegetarian” dates only to the 1840s, by which time some of the modern notions that go with it were already established, at least in Britain and soon in North America as well. The practice seemed more than mildly eccentric perhaps. *The Times* of London would speak editorially of the “vegetarian humbug.” The fact that there were 12 vegetarian restaurants in London in 1883

and only 16 by 1968 makes acceptance sound more painfully slow than it was. During the Second World War, for instance, nearly 40,000 Britons applied to be taken off the meat ration on the grounds that they were vegetarians. Respect has been hard won. But then, as Spencer shows, finding a place on the edges of the mainstream has always been the most difficult part of a balanced vegetarian diet, back to ancient times.

Until the 19th century, vegetarianism was usually called “the Pythagorean diet” after the Greek philosopher, mathematician, and astronomer Pythagoras, who was active in the 5th century BCE. He advocated a strict and simple meatless diet—that was one of the rules of the community he founded in Italy—because of his view that human souls and those of animals were interchangeable at death. This is very close to the vegetarian principles of Hinduism and of Buddhism in various parts of the world. Of course, a meatless existence was the norm for people who had no meat or else had to use their animals in more productive ways. But Pythagoras made meatlessness part of what Spencer calls “a complete and compelling philosophy based on non-violence and mystic union with all living things.” The importance of his mysticism is easily undervalued today. He was in fact considered a magician. Bertrand Russell, centuries later, would call him “a combination of Einstein and Mrs [Mary Baker] Eddy,” the founder of Christian Science.

As for vegetarianism in biblical

times, this is a highly specialized and enormously complicated subject of its own. Readers would be well advised to read Spencer in conjunction with another new book, **The Lord’s Table: The Meaning of Food in Early Judaism and Christianity** by Gillian Feeley-Harnik (Smithsonian, US\$14.95 paper). There is a sharp break between the Old Testament and the New. As Spencer says: “Everything hinges upon the dietary rules in the Old Testament. In the beginning, paradise is vegetarian. All creatures are herbivores. Adam and Eve and all living creatures co-exist harmoniously. Yet there is no question, even in this Utopia, who was the superior creature. Let man, God decreed, ‘have dominion over the fish and the sea, and over the fowl of the air, and over the cattle, and over the earth, and over every creeping thing that creepeth upon the earth.’”

There rose up a sect of “vegetarian fundamentalism Christians” such as Mrs. Joseph Brotherton, author of *A New System of Vegetable Cookery* (1821), who “wrestled with the problem of New Testament text. Why, she asked, did Christ not make it clear that killing animals for meat was a sin? In the New Testament it never actually says that Christ eats meat, but He does eat fish. So Mrs. Brotherton with great ingenuity reinterpreted the text: the word fish, she claims, really means watermelons or lotus plants.” Spencer adds drily: “This obviously shed new light on the miracle of the loaves and fishes.”

One of the most significant figures in vegetarian history is Thomas

Tryon (1634-1705), author of *The Way to Health* and many other works on the subject, but he is not much remembered today because he had no other professional renown. Tryon thus stands in contrast to such people as the poet Shelley, who was so "fervent in his renunciation of flesh" that many followers of his poetry and his politics would adopt his diet as well; or later, Leo Tolstoy, a mid-life convert to vegetarianism, who "lifted the image of the movement from provincial eccentricity to lofty idealism." George Bernard Shaw and M. K. Gandhi, absolute opposites as personalities, at one time seemed to share the role of world's most famous living vegetarian.

These few words give only the crudest possible overview of the lines of thought Spencer explores in *The Heretic's Feast*, a book so rich that little can be done in the space available here but to ask you to accept my recommendation on faith.

SOME OTHER NEW BOOKS OF SPECIAL interest to *Rotunda* readers:

- Like any yarn about a dynasty, Virginia Morell's book **Ancestral Passions: The Leakey Family and the Quest for Humankind's Beginnings** (Distican, \$40) has a lot of strong-willed characters who are often at one another's throats. Louis Leakey, palaeontologist and archaeologist, went to Africa in 1902 and rewrote the story of human evolution through a long chain of discoveries of human bones and relics. His luck began with relics in Olduvai Gorge in Tanzania, though Morell claims he grabbed the glory of other people's discoveries—specifically, those of Germans forced out of the area after the First World War. Then, in 1948, Louis found the skull of *Proconsul africanus* near Lake Victoria, showing that humans had ape-like antecedents that lived 25 million, perhaps even 40 million, years ago, and moreover that the origins of human life are in Africa. His wife Mary's work was also important; indeed, the outside world perceived them as a celebrated team joined in

time by their sons, Philip and the telegenic Richard. But Morell shows how, to say the least, they have had trouble getting along. Philip and Richard, for example, have ended up in opposing political parties in Kenya. Most recently, in fact, Richard has started a party of his own after being forced to resign as head of the country's wildlife and parks department. The story reads a bit like a TV mini-series.

- This column is always on the lookout for genuinely useful books on outdoor living, a field in which much of what is published often presents little that is new or useful. Two exceptions are Annie Getchell's book **The Essential Outdoor Gear Manual: Equipment Care & Repair for Outdoorspeople** (McGraw-Hill Ryerson, \$27.95 paper). This clear, comprehensive, and well-thought-out little encyclopedia covers everything from cook-stoves to zippers to canoes, both praises and warns against silver duct-tape as a cure-all, and even tells people who haven't the foggiest how to sew on buttons and perform other minor feats of mending. Another book to keep in one's pack is *A Bird-Finding Guide to Ontario* by Clive E. Goodwin, an old stand-by (first published 1982) that has now been updated and considerably enlarged (University of Toronto Press, \$24.95 paper). There are perhaps a couple of regional bird books of this quality, but no other one that takes in the whole province.

- **Historic Britain from the Air** by Nicholas Best and Jason Hawkes (Little, Brown of Canada, \$38.95) is the latest in a series of big books made of pretty aerial photographs of familiar places. This one is certainly as attractive as any of the others—England is indeed a "green and pleasant land," as William Blake wrote—but one begins to note some peculiarities. Stonehenge and Hadrian's Wall both look much less impressive from overhead, for example, while the geometries of the oldest cities are fascinating. You can almost detect the process by which forts and castles became the nuclei

of towns and cities and how meandering animal trails were easier to use as crooked, winding streets than to straighten.

- **Nova Scotia Folk Art** (Nimbus, \$12.95 paper) is the catalogue of a small but wide-ranging exhibition curated by Bernard Riordon of the Art Gallery of Nova Scotia and circulated in the United Kingdom by the Canadian government. This is true folk art rather than mere craft, because it arises from deep within the bubbling imaginations of entirely self-taught or naive artists. A number of the pieces are quite poignant in their perhaps unwitting insistence on keeping alive that which existed before mass culture penetrated even the smallest place in the province. The text is enlightened in its avoidance of art-speak, and there are useful biographical notes on all the artists.

- Similar in a way, but far more out on the edge, is John Beardsley's **Gardens of Revelation: Environments by Visionary Artists** (Abbeville, US\$60), a larger-than-usual-format photography book on places such as the Watts Towers in the slums of Los Angeles—ornamental gardens that artists have seen fit to build out of the detritus of our consumer society, sometimes to make a political point, at other times just to create a garden of sorts in the (almost always) urban wilderness. This impulse is put in an international context, but the form would seem to be pretty much an American endeavour.

- Lewis H. Morgan (1818-81) was a classic example of the antiquary. Antiquaries are people who interpret history by superficial study of objects they have collected, and they are now in deep disrepute (though, curiously, the professional historians' body in Britain continues to call itself the Royal Society of Antiquaries). But such people have their uses. In **Lewis H. Morgan on Iroquois Material Culture** (University of Arizona Press, US\$75 cloth, US\$35 paper) Elisabeth Tooker tells how Morgan was commissioned by the government of New York state

to assemble as complete a collection as possible of Iroquois tools, weapons, crafts, etc. He was limited to New York state but the implications for the contiguous parts of Canada are obvious. In any case, he recorded everything meticulously and made careful watercolour sketches (lovely in themselves), which is all to the good as the state's collection eventually was lost in a fire and the collection of watercolour sketches is now the only extant record.

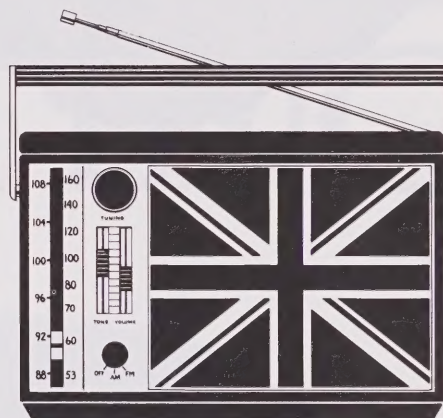
- **The Rise of Fishes: 500 Million Years of Evolution** by John A. Long (Johns Hopkins University Press, US\$49.95) is a lovely piece of publishing, with more than 300 colour photographs, as well as comprehensive maps and numerous drawings and charts, to show how different species of fish have evolved differently in particular oceanic conditions but following the same general pattern. Much of the author's knowledge comes from the study of fossils, of course, and there is a great deal about how scientists have learned to interpret these more accurately through the centuries.

- I'm usually distrustful of collections of essays on a particular topic in which different historians contribute pieces on their own often painfully narrow specialties. The result is more often an academic hiring hall than a survey of the subject. An admirable exception is **The World of Roman Costume** edited by Judith Lynn Sebesta and Larissa Bonfante (University of Wisconsin Press, US\$47.50). Theirs is the first serious attempt to reassess the subject since the 1930s, and they carefully make a complete picture by bringing in experts with overlapping knowledge based on the literature, religion, culture, and politics of the Roman world. The historians show how that which evolved from Grecian styles ended by melding into early Christian and finally medieval ones.

DOUGLAS FETHERLING

Douglas Fetherling is book review editor of Rotunda

JOLLY GOOD NEWS



BBC News

Monday to Saturday: 8:00 a.m.

Non-commercial Radio

91.1
CJRT-FM



A Lone Vegetarian

HERE IS THE FOSSILIZED SNOOT OF A REMARKABLE NEW CROCODILE-LIKE Reptile whose remains were collected in the 1960s from the Early Cretaceous sedimentary rocks exposed along the Yangtze River, opposite Yichang in Hubei Province, China. From the time of its discovery, the animal had puzzled researchers. Although the bones clearly establish that this reptile was closely related to present-day crocodilians, its singular “cheek” teeth indicate that it fed on plants—the first known “vegetarian” in a lineage of fearsome predators.

Because of the combination of rather mammal-like teeth and typically reptilian bones, ROM palaeontologists Xiao-chun Wu and Hans-Dieter Sues named it *Chimaerasuchus* after the ancient Greek mythical monster with the body parts of different animals. A land-dwelling creature, *Chimaerasuchus* was about one metre long and lightly built. It apparently left no descendants. ❖

PHOTOGRAPH BY BRIAN BOYLE

Have a seat. You'll need one when taking in the dramatic improvements we've made to the All New 1996 Mercury Sable.

From there you'll notice things like the quietness of its interior. A flip of the armrest reveals an innovative storage space and cup holder. All of the controls, the seat, in fact the car itself feels more substantial.

That same solid feeling intensifies when you get on the road. Sable's advanced suspension handles every

bump and curve. And its refined V6 engine answers your call for countless kilometres. So, as you may have guessed by now, we suggest you take the new Sable for a test drive.

Of course, advance booking is highly recommended.

For more information on the All New 1996 Mercury Sable, call 1-800-561-3673.



MERCURY SABLE
Ford Motor Company, of Canada, Limited

ADVANCED SEATING.





Royal Doulton

THE CROWNING TOUCH FOR CHRISTMAS

COUNTESS OF HARRINGTON
carries an exquisite floral wreath in
which each of the 59 individual
petals and leaves is made and
painted by hand.

Size: 9 1/2" (24 cm) tall
Limited edition: 5,000
Numbered certificate
of authenticity



The Countess of Harrington is one of four, limited edition figurines from **Royal Doulton's Reynolds Ladies** collection. These figurines are inspired by portraits painted by **Sir Joshua Reynolds**, one of England's greatest eighteenth century portrait painters, and brought to life by sculptor Peter Gee. Brochure available upon request.

HOCKRIDGE

"TORONTO'S FIRST CHINA SHOP"

China, Crystal, Silver Merchants since 1900
638 Yonge Street, Toronto, Ontario M4Y 1Z8

(416) 922-1668

Mon. - Sat. 11 a.m. - 6 p.m. We ship worldwide